Montana Outdoors

May / June 2003

$2.50

SOMETHING'S FISHY
about eastern Montana

MILLTOWN DAM
The clock is ticking...

WET AND WILD
We dip into Flathead Lake State Park

MISSOURI RIVER TROUT
FWP works to keep the ribbon blue

PETAL PROBER: Looking more like a hummingbird than an insect, a sphinx moth draws nectar from a monkey flower in Glacier National Park. Take your own sip of wildflowers beginning on page 27. Photo by Kerry T. Nickou.

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Montana Outdoors (ISSN 0027-0016) is published bimonthly by Montana Fish, Wildlife & Parks. Subscription rates are $9 for one year, $16 for two years, and $22 for three years. (Please add $3 per year for Canadian subscriptions. All other foreign subscriptions, airmail only, are $25 for one year.) Individual copies and back issues cost $3.50 each (includes postage). Although *Montana Outdoors* is copyrighted, permission to reprint articles is available by writing our office or phoning us at (406) 495-3257. All correspondence should be addressed: *Montana Outdoors*, Montana Fish, Wildlife & Parks, 930 West Custer Avenue, P.O. Box 200701, Helena, MT 59620-0701; or e-mail at montanaoutdoors@state.mt.us. Our website address is fwp.state.mt.us.

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For address changes or other subscription information, call

800-678-6668

POSTMASTER: Send address changes to *Montana Outdoors*, Montana Fish, Wildlife & Parks, 930 West Custer Ave., P.O. Box 200701; Helena, MT 59620-0701. Preferred periodicals postage paid at Helena, MT 59620, and additional mailing offices.

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Montana Outdoors

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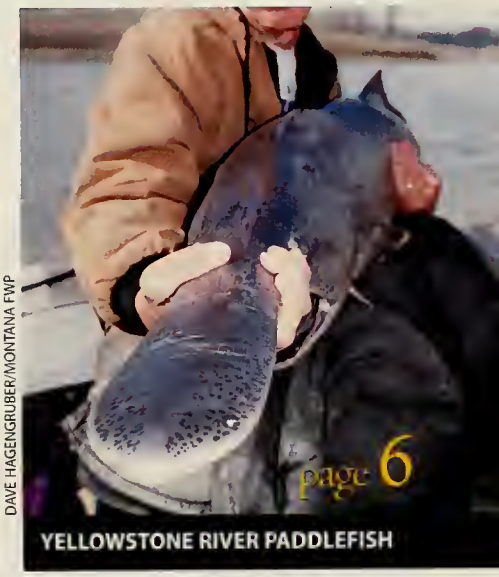

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COVER PHOTO: Also called bronzeback and red-eyed bass, the smallmouth bass is just one of a dozen-plus sport fish species found in eastern Montana waters. Photo by Eric Engbretson.

Nature in the raw

On a recent morning, my wife and I heard a loud bang on our front window. I looked out to find a female mallard, which had flown into the window, sitting below, dazed. At the same time I noticed a brownish hawk (which, I later learned from the local FWP wildlife biologist, was likely an immature goshawk) perched on an alder branch overhanging the creek that flows about 50 feet past our townhouse complex.

Soon the goshawk dropped down on the mallard and dragged it out onto the snow-covered lawn. With one talon pinning down the hen's neck and the other on its rump, the raptor proceeded to pluck feathers from a part of the duck's breast with its beak. Then it started to eat the hen.

The mallard mounted a fight and dragged the goshawk several feet across the crusted snow. But to no avail; the raptor was able to keep the duck on its back and continued to eat it alive.

By mid-afternoon, my wife and I had to leave. When we returned later that day, the hawk was gone and the partially eaten mallard had expired.

You would think this would be the end of the tale, but no. The very next morning, we saw the goshawk drag another mallard, this time a drake, up from the creek onto the crusted snow, where it pinned the duck and began to eat its back meat. The two struggled, but the goshawk stayed on top of the mallard and we watched a reenactment of the previous day's drama.

The FWP biologist I talked to later said that goshawks often pluck and eat their prey alive.

My wife and I debated whether I should shoo the hawk off, thus saving the ducks' lives. We concluded that goshawks, which also must eat to live, are a part of the intricacies of nature, and that their dining habits probably sharpen the defenses of waterfowl.

> "We concluded that goshawks, which also must eat to live, are a part of the intricacies of nature...."
>
> —Ben H. Slothower
> *Bozeman, Montana*

Nature in the raw is, indeed, seldom mild.

Ben H. Slothower
Bozeman

No Mall of America here

In response to Mr. Lindberg of Andover, Minnesota ("Letters," March/April), I would like to point out to him and all those nonresident hunters who gripe about the fees that we live and work here 365 days a year. I have worked in his and many other states and know first-hand that wages there are much higher than in Montana.

I love Montana, but life here does not include the Mall of America or half the services available in Minnesota or other states. Most transplanted residents or visitors consider Montana harsh and tough. For being here and paying our share 365 days a year to provide land, access, and management, as well as all the services nonresidents want when they arrive to take a trophy home, residents deserve the right to hunt cheaper and first in this state.

I think if visitors to Montana would look at their own state's fee schedules, they would see that their nonresident fees are not "level" either.

Ginger Baker
Roundup

Got it in for dams?

I notice a strong bias against hydropower dams in articles in the recent copy of your magazine ("A Dam Improvement," "Barely Afloat," March/April). Why don't you point out the importance of dams to the economy and not just how they cause a few problems for fish?

M. Jay Miller
Milwaukee, Wisconsin

Editor replies: *We've got nothing against dams except that some damage fish populations. We recognize that many great trout fisheries wouldn't exist without the cold tailwaters dams create (see this issue, pages 11 and 31). And there's no denying hydropower dams produce electricity we all use. But one big cost of hydropower dams is their disruption of river life, especially native trout populations (see page 17). That's not environmentalism claptrap but simply a fact, one acknowledged by power companies such as Avista Corporation (an employee of which co-wrote one of the March/April dam articles). Because* Montana Outdoors *advocates the conservation and sustainable use of fish and wildlife, we run articles that detail the effects of dams on fish populations, good and bad.*

No need to kill a big one

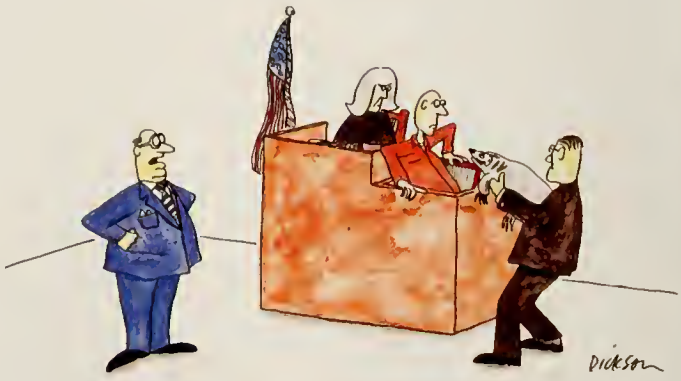
I'm 60 years old and agree very much with Mr. Jeff Hagener's statements ("Our Point of View," March/April) about being more interested these days in the ambiance of the outing than in filling his tag.

My son and I try to make a trip west each year to hunt and possibly get a nice elk. But more important is to just be out together and share in the fun of the hunt.

Don't get me wrong; I enjoy harvesting a nice bull elk or buck deer, but I feel that the quality time my son and I, along with our friends, spend outdoors together far outweighs the need to just kill a big one.

William H. Link
Shanks, West Virginia

■ We welcome your comments, questions, and letters to the editor. We'll edit letters as needed for accuracy, style, and length. Mail your letter to: Montana Outdoors, P.O. Box 200701, Helena, MT 59620-0701. Or e-mail us at: tdickson@state.mt.us



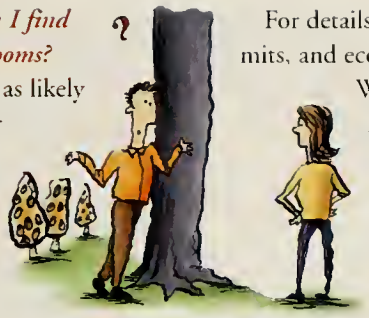
TOM DICKSON

"Objection, your honor. Counsel is obviously badgering the witness."

Q. *Where can I find morel mushrooms?*

A. People are as likely to reveal their morel hunting hotspots as they are to give out their correct weight or age. That said, probably the best way is to ask around at social events and then befriend a gregarious morel hunter.

If you hunt solo, know that morels are found in springtime along river bottoms under mature cottonwoods and in recently burned-over areas.



ILLUSTRATIONS BY JEFF TOLBERT

For details on safety, permits, and ecology, visit the Western Montana Mycological Society's website at fungaljungal.org/index.html.

Q. *What's the best source for locating U.S. Forest Service, BLM, and other maps?*

A. Most outdoors stores sell these maps, which are essential for finding public recreation lands and avoiding trespass on private property. For a complete list of maps and where to find them, call Montana FWP (406-444-2535) and ask for the "Directory of Montana Maps." On the Internet, check out: publiclands.org/html/home.html (run by the nonprofit Public Lands Information Center), nris.state.mt.us/gis/gis.html (Montana Natural Resource Information System), and the FWP site: fwp.state.mt.us.

Q. *How can I get different bird species to come to my backyard feeder?*

A. The key, say bird feeding experts, is to provide more food diversity as well as perching areas and a water source. Oil seeds (black sunflowers) will attract almost any bird that comes to a feeder. Ground-feeding species go for white millet. A thistle feeder will attract goldfinches and pine siskins. Suet cakes are irresistible to woodpeckers, chickadees, and nuthatches (though starlings like them, too). For Bullock's orioles, try placing an orange slice on a post or tree branch.

? *Wonder about some part of Montana's natural world? E-mail us at: tdickson@state.mt.us*

OUR POINT OF VIEW

JEFF HAGENER | *Director of Montana Fish, Wildlife & Parks*

Plans Must Address Habitat

Montana Fish, Wildlife & Parks

How far should Montana FWP go to develop conservation plans for species such as sage grouse that are, or may be, listed by the federal government under the Endangered Species Act? Specifically, should the plans address land use, even though FWP has no authority over private property or other agencies' lands?

This question is being hotly debated around kitchen tables and in legislative committee rooms. Some Montanans say FWP is going too far by including habitat and grazing guidelines in the state's latest proposal for sage grouse conservation. Others maintain that FWP is not only authorized, but obligated to develop comprehensive strategies that include land use provisions.

Here is our point of view: If FWP does not come up with effective strategies for conserving species such as sage grouse, the odds are much greater that they will be listed by the federal government under the Endangered Species Act. Although sage grouse populations in Montana are currently healthy, this species is declining over much of its historic range in the West. As the federal government considers listing this species, it will look closely at what every state is doing to conserve sage grouse.

We do not want to see sage grouse listed. Federal listing is a sign that range-wide efforts to conserve sage grouse are failing; it also signals a loss of state management and more bureaucracy. Federal listing can also mean even more stringent land use restrictions on public and private land than would be necessary if we could prevent the need for listing.

How do we prevent the sage grouse from joining the grizzly bear and bull trout on the federal list of threatened or endangered species in Montana? The best way is to develop conservation plans that address the full range of threats to the bird, and that includes threats to its habitat. Because sage grouse depend on sagebrush plant communities that have a healthy grass and forb understory, we need to include habitat management in the conservation plan.

FWP does not own or control much sagebrush or grassland habitat, so we must work with private landowners and state and federal land managers to meet the habitat needs of sage grouse. One major step so far has been to convene a broad-based group of ranchers, biologists, and other conservation-minded people to talk about how best to conserve sage grouse in Montana.

Their proposed plan covers areas within FWP's legal mandates, such as hunting, but it also includes guidelines for managing habitat and land use practices like grazing. If it didn't, the plan would be incomplete and would not conserve sage grouse to the satisfaction of the U.S. Fish and Wildlife Service. As a result, the species would probably be listed as a federally threatened species.

FWP does not have authority over land use, but our ability to conserve Montana's fish and wildlife depends on habitat just as the species themselves do. That's why we constantly seek to involve those who do have authority over land—both private property owners and land managing agencies—to join with us in our shared task of ensuring the future abundance of Montana's wildlife treasures.

M. Jeff Hagener

DENVERBRYAN.COM

The state's preferred plan would maintain 15 breeding pairs of wolves.

State releases its choice for wolf management plan

Montana's preferred alternative for managing gray wolves would maintain at least 15 breeding pairs of wolves, allow the species to maintain a viable population in the state, and yet stay flexible enough for ranchers to kill wolves that threaten livestock.

The favored alternative was among five released in mid-March as part of a draft environmental impact statement on wolf conservation and management in Montana.

State wildlife officials anticipate that the U.S. Fish and Wildlife Service will remove the Rocky Mountain gray wolf from the federal endangered species list in 2004. Wolf numbers in Montana have increased 50 percent in the past year, from 120 to 180 animals in 33 packs, which have a total of 16 breeding pairs. Before delisting can occur, Montana, Idaho, and Wyoming must provide the USFWS with draft wolf management plans that ensure the viability of wolf populations and habitat.

"Most Montanans seem ready for the wolf to be delisted," says Jeff Hagener, Montana FWP director. Hagener believes it's time for the species to come under state control and be managed in the same way as mountain lions, black bears, and other thriving wildlife species.

The state's preferred alternative is based on recommendations by an advisory council established in 2000 representing livestock producers, environmentalists, hunters, educators, and other interests. The preferred plan commits Montana to maintaining a recovered wolf population and to ensuring wolves are not reclassified as threatened or endangered under federal law. It also maintains that wolves should be managed on sound ecological principles that allow for public taking when the population rises to where it can biologically sustain a regulated harvest. And that ranchers should be able to defend their property from wolves attacking or threatening to kill livestock, just as they can other large predators under state management.

The other alternatives ranged from maintaining the wolf under federal protection to aggressively keeping the wolf population at no more than ten breeding pairs, the lowest level acceptable to the USFWS.

Carolyn Sime, the FWP's wolf plan coordinator, explains that the state's preferred alternative offers enough management flexibility to address conflicts while ensuring that FWP will continue to meet the ecological needs of wolves and their prey, primarily deer and elk.

She says that to fully put the plan into action, the federal government and private groups will need to provide some of the $800,000 it will take to fund wolf conservation and management in Montana each year. The money is needed to monitor wolf and prey populations, pay for enforcement, increase public information, and compensate stockgrowers for losses from wolves.

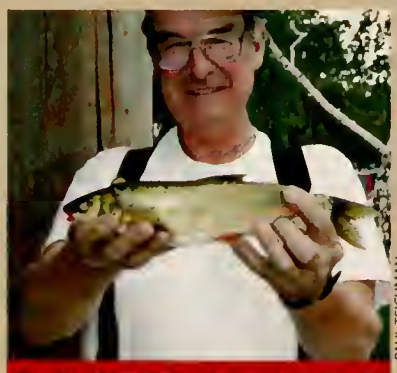
In early spring, FWP held 13 work sessions across Montana to gather public comment on the draft EIS. In June, the agency will reconvene the wolf advisory council to decide on a final plan for the state.

TWO STATE FISH RECORDS FALL

Is it mostly luck? Or do some anglers just know how to catch big fish?

Whatever the reason, two Montana anglers broke state fishing records in 2002. The first lunker was caught by record-fish veteran Mike Otten on August 30. The Lewistown angler was fishing Fort Peck Reservoir with a live crayfish when he hooked and landed a 21-inch smallmouth bass weighing 6.66 pounds. The football-shaped smallie, which had a girth of 17 inches, barely topped Otten's existing state record of 6.45 pounds, caught in 2001.

The next record fell a few weeks later when Paul Teichman of Kalispell hauled in a 1.05-pound peamouth while fishing Flathead Lake.



PAUL TEICHMAN

Paul Teichman's monster peamouth.

A member of the minnow family, the peamouth looks something like a trout but has a deeply forked tail and lacks an adipose fin. It can be quickly identified by its reddish mouth, which looks like the fish has been drinking raspberry juice. Teichman caught his 13.7-inch-long peamouth on September 16 while fishing for lake trout and whitefish. His catch shattered the previous state peamouth record of 0.7 pounds.

Both anglers received certificates verifying their status as new state record holders.

Montana FWP keeps a complete list of all Montana record fish on its website at fwp.state.mt.us/fishing/fishrecords.asp.

LIZ LODMAN/MONTANA FWP

Since 1994, Montana BOW has fired up 800 women for the outdoors.

Ten years of teaching women confidence in the outdoors

There was a time when Delle Kemner had no interest in the natural world. She grew up in Kansas City, Missouri, living the cars-pavement-mall life of a typical urbanite. "I hated the outdoors," says Kemner, 38.

Then she moved to Montana, where, in the past few years, the mother of three has skinned a rabbit, learned to call wild turkeys, and fired a muzzleloader rifle. Last fall, Kemner shot a deer, which she and her family butchered and wrapped themselves.

Kemner learned to love the outdoors by, of all things, attending a class. In 1999, she took a Becoming an Outdoors-Woman summer workshop and has taken several others since. She joins the more than 800 women who have participated in the program since it began in Montana in 1994, and the more than 150,000 in the United States and Canada who have participated since BOW began in Wisconsin in 1991.

Coordinated through FWP, the Montana program provides hands-on instruction in a range of basic outdoors skills, such as backpacking, firearms use, fly fishing, and outdoors survival.

This year marks BOW's tenth anniversary in Montana.

Kemner, of Missoula, says she was most impressed by a BOW class on trapping foxes and other furbearers.

"I wasn't even interested in fur before that," she says. "Now I just love it. The instructor talked about traps and furbearer biology, and it was interesting to see the politics of the issue from the other side."

Liz Lodman, program coordinator, explains that BOW was created to provide women with an opportunity to learn outdoors activities and skills with other women in a supportive atmosphere.

Researchers have found that most men learn to hunt, fish, and camp as boys from their fathers. Often, girls interested in the outdoors aren't included.

"We want to learn the correct and safe way to handle a firearm and cast a fly," Lodman says. "We want to know what to look for when buying equipment and how to find public land for hunting, fishing, and camping. BOW teaches that."

Advanced workshops, called Beyond BOW, teach additional skills such as bowhunting.

Lodman says participants vary widely in age, profession, and experience. "We've had a psychologist in her 70s, a woman with multiple sclerosis who was a night nurse, and lots of college students and young moms," she says.

Grandmothers, too, like Dorene Amber, 57, of Billings. Though she grew up on a ranch and had seen game killed and butchered, Amber never learned to hunt.

"I've always liked the outdoors just as much as I like to bake and sew," says the independent mail contractor. "BOW gave me confidence that I could hit a target and safely handle a gun."

Last fall, after taking two BOW classes, Amber went deer hunting for the first time, accompanied by a hunting friend. "I borrowed a rifle and went to the range and sighted it in like they'd taught us," she says. "Then I went out and made a great shot and got my first buck ever."

The summer 2003 BOW workshop will be held in the Beartooth Mountains, August 15–17. Though rustic, the overnight lodgings include indoor restrooms and hot showers. Participants must be 18 years or older. Cost is roughly $190. For more information, call Liz Lodman at (406) 444-2615.

Stressed but not harmed

A study by Montana State University published in *Conservation Biology* found that individual elk in Yellowstone National Park showed increased signs of stress when snowmobiles were nearby. However, overall elk populations appeared healthy and stable, despite the frequent presence of snowmobiles.

WHAT FISH IS THAT?

Can you tell a native carpsucker from a nonnative carp? How about a bull trout from a lake trout? A black crappie from a white crappie? Identifying these and other species has been made a lot easier with the recent publication of FWP's *A Field Guide to Montana Fishes*. The updated guide contains range maps, physical characteristics, and natural history of 88 species ranging from the monstrous white sturgeon to the tiny pygmy whitefish. This new edition includes 32 color images by noted fish illustrator Joseph Tomelleri, considered the Rembrandt of modern fish illustration.

The guide sells for $5 and is available from FWP offices statewide.

BIG (AND PLENTIFUL) FISH ON THE PRAIRIE

Some anglers say there's no decent fishing east of Great Falls and Billings. Here are nine angling hotspots that say they're wrong (or lying)

BY ANDREW MCKEAN

NORTHERN PIKE IN THE NET AT FORT PECK RESERVOIR BY PAUL F. UPDIKE

Pity those who fish in eastern Montana. The flat, arid region offers few natural lakes, which, due to winterkill and drought, rarely hold fish for more than a few years. Reservoir fishing can be decent when there's water, but that hasn't been the case lately. The big, muddy rivers produce some good fishing, if you can handle the mosquitoes. But why would an angler want to risk catching something that looks like a living fossil, a fish that grubs the bottom with its hideous mouth and creepy, wormlike whiskers? A waste of perfectly good bait.

No wonder you seldom see eastern Montana featured on the cover of fishing magazines.

Fact is, most local anglers are happy to keep it that way. Eastern Montana's little secret is that, despite its reputation to the contrary, it offers some phenomenal fishing: scrappy smallmouth bass, trophy walleyes, tasty channel catfish, bench-sized paddlefish, prehistoric sturgeon, and more, including one of the nation's top trout fisheries.

In some waters you can catch a dozen or more different warmwater species. Others are famous for producing state records. All are places that will surprise anglers who think of Montana fishing only in terms of trout rising to mayflies on freestone rivers with snow-capped mountains in the background.

Here, then, are nine great fishing holes in the state's prairie region, listed in no particular order (and with apologies to eastern Montana anglers who thought they had these great spots all to themselves):

NEAL & MJ MISHLER

NOTHING LIKE THIS IN THE MADISON: Looking for crappies and other tasty panfish? Load the family into the car and start driving east. Don't forget a fillet knife.

1 THE CONFLUENCE OF THE MARIAS, TETON, AND MISSOURI RIVERS

One of the fishiest spots in Montana sits beneath the khaki bluffs around Loma, 50 miles northeast of Great Falls along Montana Highway 87. This is where the Marias and Teton Rivers wed, run together for less than a mile, and then join the Missouri.

The knob overlooking the confluence, Decision Point, is one of Montana's historic crossroads. For nearly a week in June 1805, Lewis and Clark camped near here and debated whether the Marias (then swollen with runoff) or the Missouri was the real route to the Pacific Ocean.

Today the Marias is controlled by Tiber Dam, 35 miles upstream, which keeps the river flowing at just a fraction of the Missouri's rate, even after runoff. The Corps of Discovery leaders struggled here to find the Northwest Passage. Visitors to the site today mainly struggle over which of dozens of fish species to pursue and what bait or lure to use.

Decisions, decisions.

"Confluence areas are always rich, biologically speaking," says Bill Gardner, local FWP fisheries biologist. "We have documented 47 species in that area. That's about as rich as it gets in Montana."

The confluence is one of the best spots in Montana to catch a shovelnose sturgeon (the aforementioned "living fossil"). Plan a trip here in late May, when thousands of the mud brown, shark-tailed fish push up the Marias in search of spawning gravel. Though strange looking, these prehistoric relics are strong as salmon and taste wonderful. (The endangered pallid sturgeon also swims here, so anglers should learn to tell the two species apart.)

May is also the time to catch sauger, a cousin of perch, which Gardner says migrates up the Missouri for more than 100 miles to spawn on the tributary's gravel bars. Bonus fish for springtime anglers are goldeye—a scrappy species delectable when smoked—as well as channel cats, northern pike, walleyes, smallmouth bass, and even resident brown and rainbow trout.

"Fishing the confluence can be a little like Christmas," says Gardner, who recommends fishing a plain old worm on the bottom for most species here. "You never know what you're going to get."

Other catchable fish include redhorse, longnose suckers, bigmouth and smallmouth buffaloes, river carpsuckers, freshwater drum, stonecats, and carp.

"One of the noteworthy things about fishing at the confluence is how many people come here from elsewhere in Montana," says Gardner. "I have friends from Missoula and Bozeman who make an annual trip just to get their warmwater fishing fix. This is about the closest place where western Montana anglers can have consistently good fishing for species that don't exist where they live."

GARY LEPPART

WARMWATER GRAB BAG: Where the Marias, Teton, and Missouri Rivers meet, anglers can be sure of only one thing—they will have no idea what fish species is attached to the end of their line.

2 BEAVER CREEK PARK

CRAIG & LIZ LARCOM

QUIET CASTING: A fly angler fishes from a float tube in Bear Paw Lake. To maintain the peaceful setting, no motors are allowed here, so the only way to ply the depths is from a float tube or canoe. Downstream, Beaver Creek Reservoir does allow boats, but the park imposes a 10-horsepower limit and a no-wake regulation.

Where can you troll spinner rigs for walleyes one minute and then cast dry flies for cutthroat trout the next? In one of the nation's largest county parks, just south of Havre.

"People are always surprised they have this variety, and that it's almost all on public land," says FWP fisheries biologist Kent Gilge of the fishing in Hill County's Beaver Creek Park. "You can start at the head of the park up in the Bear Paw Mountains and fish for brookies, then fish for Yellowstone cutthroats, rainbow trout, and smallmouth bass in Bear Paw Lake (known locally as Upper Lake), then catch rainbows and browns in the middle section of Beaver Creek. A little farther downstream, Beaver Creek Reservoir (known locally as Lower Lake) has pike, smallmouth bass, and all the perch you want to catch, plus good numbers of walleye and rainbow trout."

The abundant fish grow large here, too. "We've caught walleye up to 15 pounds in our sampling nets," says Gilge. "And that was in the fall, when the females didn't have eggs. With all the crayfish and perch in Beaver Creek Reservoir, the walleye and smallmouth are in great shape."

To reach the 10,000-acre Beaver Creek Park, head south from Havre on Route 234 roughly 10 miles until you reach the foothills of the Bear Paw Mountains. The visitor center is another 10 miles into the park. Entrance fee is $5 per day per car. Bring a tent for overnight stays; the park offers more than 100 campsites available year-round. But boats aren't necessary. There's plenty of creek to walk, and anglers can fish effectively from shore at either lake. Call the Beaver Creek Park office at (406) 395-4565 for details.

3 NELSON RESERVOIR

They ought to call it Lunker Lake, because more state record fish have been caught in this prairie reservoir east of Malta than in Fort Peck Reservoir, Flathead Lake, or anywhere else in Montana.

Bear in mind, the species caught in Nelson Reservoir don't exactly trip off the tongue of most Montana anglers. The record behemoths include the bigmouth buffalo (57.75 pounds), carp (40.20), goldeye (3.18), smallmouth buffalo (32.63), and white sucker (5.33)—not exactly travel-brochure species. But for anglers who want to catch lunkers, and especially those after a state record, this fish factory merits attention.

SMALLMOUTH BUFFALO BY ERIC ENGBRETSON

"Nelson is very, very productive," says FWP biologist Kent Gilge. "It's the end of the line for the entire Dodson South Canal system, so it functions as a nutrient sink. All that irrigation return water, which tends to be high in organics and nutrients, ends up in Nelson. Because it's not on a live stream, those nutrients aren't flushed out, so they sit there and grow fish."

The reservoir holds northern pike, yellow perch, walleyes (including, at one time, the state record), and the occasional crappie, but most of the species in Nelson are classified as rough fish, which means a species that has no limits and can be caught year-round.

Rough fish are rarely targeted by anglers, so advice on catching these species is hard to come by.

According to Rob Buffler, a national rough fishing expert, intentionally catching a bigmouth buffalo is nearly impossible because the fish are pelagic feeders that swim through the water column with their mouth open, straining zooplankton in their gill rakers.

"They could be anywhere in the lake," says Buffler.

Carp and smallmouth buffalo, on the other hand, can be caught on the bottom, often near shore in early summer. Buffler recommends light (6-pound-test) line and small baits, such as maggots or a piece of nightcrawler, on small (size 8) bait-holder hooks. Corn or small balls made of dough also work well. He also says carp can be taken on white dry flies such as a small White Wulff. The fly resembles cottonwood seed fluff, which in early summer blows across the lake surface and attracts carp, which eat the seeds.

Andrew McKean is an FWP regional information officer in Glasgow.

4 THE MOUTH OF THE MILK RIVER

JAN FINGER/REDPINE

THE CAT'S MEOW: Where the Milk meets the Missouri is one of the best spots in Montana to catch channel catfish. The powerful and tasty fish are easily distinguished from round-tailed bullheads by their deeply forked tail. Catfish stick near the bottom, where they will take any number of baits. The often-aggressive fish will also chase crankbaits, jigs, and even Woolly Buggers and other streamer flies.

ANOTHER CONFLUENCE RICH in fishing opportunities is where the serpentine Milk meets the huge Missouri southeast of Nashua, just a few miles downstream of Fort Peck Dam. Channel catfish are plentiful here throughout the summer, but those who hit the multi-species spawning runs in late April through mid-June might also catch a shovelnose sturgeon, sauger, walleye, northern pike, or one of the many overlooked native nongame fish species, such as the rare blue sucker.

"The remarkable thing about the Milk River is that it's a relatively intact ecosystem, considering the severe irrigation withdrawals, at least for the first hundred miles or so upstream from the mouth until you hit Vandalia Dam near Hinsdale," says Bill Wiedenheft, FWP fisheries manager for northeastern Montana. "The water out of Fort Peck Dam is cold and relatively clear, but most of the fish in the lower Missouri evolved in warm, turbid water, and they still find that in the Milk. It's one of the most important spawning tributaries on the lower Missouri."

5 FORT PECK RESERVOIR

ITS WALLEYE FISHERY IS NATIONALLY KNOWN, but Fort Peck Reservoir's superb smallmouth bass angling is a secret shared by relatively few anglers. The state record smallie, which weighed 6.66 pounds, was caught in Fort Peck last summer, and biologists say they're sure larger ones swim in the 240,000-acre reservoir.

"We've been stocking smallmouth bass on and off since 1981, and every year since 1993," says Mike Ruggles, FWP's Fort Peck fisheries biologist. "They've done very, very well here. They're nesters, so they tend to have higher natural production than walleye, which lay their eggs and then leave."

Ruggles adds that silt will often cover and suffocate walleye eggs in Fort Peck, but smallmouth eggs survive much better because the adult fish continually sweep the silt off with their fins.

What's more, smallmouth bass are more suited than walleyes to the way the U.S. Army Corps of Engineers manages water levels in the reservoir.

"In May, when walleye spawn, the Corps is releasing water, which lowers water levels in the reservoir and can expose their eggs to air," Ruggles says. "But by June, when the bass are nesting, the Corps keeps water levels somewhat consistent, so those eggs aren't as likely to be exposed."

Smallmouth bass are a highly regarded sport fish in much of the United States, though less so in the trout-minded West. The pugnacious bass attack lures with abandon and fight like a roped steer.

The best smallie fishing spots at Fort Peck are between Rock Creek and McGuire Creek in the upper Big Dry Arm, along the face of the dam, and farther west along rocky points from Hell Creek to Devils Creek. Cast minnow-imitating crankbaits or surface plugs, jig along submerged rock piles, or troll a spinner rig baited with a worm or leech. Smallmouth fishing is good throughout the summer, though earlier is better. Don't be surprised to hook a walleye, because both species ingest the same baits and lures.

JEFF HENRY/ROCHEJAUNE PICTURES

NO BOAT NEEDED: Fort Peck Reservoir is one of the nation's top spots for smallmouth bass shore fishing. Try Rock Creek, the dam face, the breakwater, or any public dock (above). Crankbaits and jigs work well, as do small minnows and leeches. The shore fishing is good throughout the summer, says FWP's biologist for the reservoir.

CHUCK HANEY

A PLACE PIKE LIKE: Northern pike were stocked in Medicine Lake to eat carp, which can muddy shallow lakes by rooting bottoms for food. The pike thrive in the fertile water and are now reaching 6 pounds.

6 MEDICINE LAKE NWR

There's rarely any doubt about what's on the end of your line if you're fishing Medicine Lake, in Montana's extreme northeastern corner. It's almost always a northern pike.

This prairie lake south of Plentywood is one of the most productive nesting sites for waterfowl in Montana. The cattails, weedy islands, and shallow-water sloughs that attract mallards and geese are also well-suited to pike. The toothy predators were first stocked in this lake, part of the Medicine Lake National Wildlife Refuge, in the late 1960s to reduce numbers of carp, according to Mike Rabenberg, deputy refuge manager.

Rabenberg says the lake averages only 6 feet deep, making it susceptible ro winterkill, which occurs when thick ice and snow prevent sunlight from reaching underwater aquatic plants. When the plants die, they decompose and use up oxygen, suffocating many of the pike.

"We lost our fish in the winter of 1996-97, and then restocked in 1998," he says. "We've had no winterkill since then, and we're continuing to stock pike, so this year we should be seeing some nice fish in rhe 4- to 6-pound range."

Plan a trip for May, when spawning pike are in weedy shallows or concentrated near any moving water in canals and water-control structures. Cast topwater lures, spinnerbaits, spoons, or crankbaits. Flyrodders can do well casting a big Dahlberg Diver and then stripping in the fly quickly.

Most of Medicine Lake is a federally managed wilderness, so only nonmotorized boats and ice augers are allowed here. Also note that the lake is closed to all recreational use from September 15 through November 15, during the fall waterfowl flight. For more information, call the wildlife refuge at (406) 789-2305 or check its website: http://medicinelake.fws.gov.

7 LOWER YELLOWSTONE RIVER

Geographers sometimes argue over whether the Missouri River is a tributary of the Yellowstone River or the other way around. For most of the year near the confluence, it's a toss-up. Both rivers are huge and moody, sculpting sand bars and carving channels. But in the springtime, when the Yellowstone roars with runoff that fell as snow on the nation's first national park to the southwest, it appears to be the mother stream.

That runoff triggers one of the strangest spawning runs in North America, as gigantic paddlefish in North Dakora's Lake Sakakawea swim against the chocolate-colored current in search of gravel bars. The first barrier they meet on the Yellowstone is the Lower Yellowstone Diversion Dam at Intake, 13 miles northeast of Glendive, where snaggers await.

Prehistoric throwbacks, paddlefish can grow to over 100 pounds, so 60-pound-test line and stout rods resembling pool cues are required. Experienced snaggers sweep the water with a fist-sized treble hook in the hopes of slamming it into the side of a paddlefish. Then the real work begins. Lugging one to shore can take a half-hour or more.

Though it sounds unsporting, snagging is the only way to catch paddlefish. Because the fish feed on tiny zooplankton they strain from water with gill rakers, they don't go after traditional lures or baits. Biologisrs say snagging hooks usually catch the fish in the fins or tail and likely cause the paddlefish no more stress than if the fish were hooked in the mouth by traditional angling methods.

If snagging lacks appeal or seems like too much work, try jigging a minnow for sauger or drowning a worm for channel catfish. The fishing for both species is good from Glendive to the North Dakota line.

WARMWATER FISHING BASICS

SMALLMOUTH BASS BY ERIC ENG-METSON

Anglers accustomed only to freestone stream trout can be intimidated by a muddy, warmwater prairie river. Which species swim here? Where do you fish? What do you use? When's the best time?

The answers to all four can be learned quickly at local bait shops. There you can find out what's hitting, which baits and lures work best, and any other noteworthy information, such as where private land isn't clearly marked.

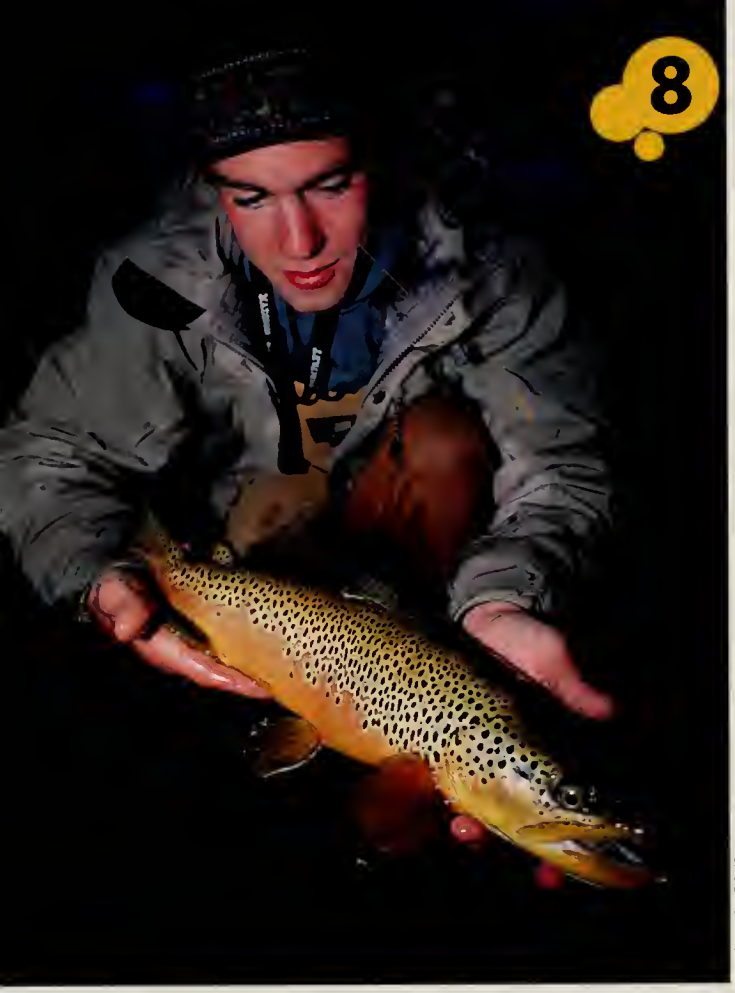
However, before walking in the door and coming across as a complete warmwater greenhorn, here are the basics:

SPECIES: Reservoirs and warmwater rivers have greater species diversity than trout rivers. Often it's hard to target a specific fish, such as a walleye, and not catch any number of other species, such as drum.

WHERE TO FISH: Here the strategy is similar to that for trout, though warmwater species generally hold in slower water than trout do. Fish current seams, eddies, and the dropoffs below riffles.

WHAT TO USE: The bread-and-butter warmwater rig is a spinning rod and reel, 6-pound-test line, a size 8 bait-holder hook tipped with half a nightcrawler, and a small split shot pinched on about a foot above the hook. Toss the offering into the current, and let it drift along a seam and rest on the river bottom. Keep the bail open and your finger on the line. Wait until you feel a tap. Let the fish take the bait for three or four seconds. Flip the bail, and slowly reel until you feel tension. Set the hook, and then start looking for your net.

—Tom Dickson



DARREN JOE IRONS

THICK WITH THICK TROUT: So productive is the Bighorn River trout fishery that first-time anglers often stand dumbstruck in the water looking down at the 18-inch browns finning in their wake. Even bigger (though relatively fewer) trout lurk downstream of Saint Xavier.

8 BIGHORN RIVER

The most productive trout fishery in Montana is miles from the nearest snow-capped peak or stately stand of fir. The Bighorn River, which holds roughly 6,000 trout per mile, flows through the arid scabland south of Hardin. Though a world-class trout fishery, this stretch of the river looks more like a place to catch sauger, suckers, and catfish, which was actually the case not too long ago.

"Before Yellowtail Dam was finished in 1966, this was a slow, meandering prairie stream with strictly a warmwater fishery," says FWP fisheries biologist Ken Frazer. The dam pools the river in the limestone canyon south into Wyoming. Trout, at first stocked and now reproducing naturally, thrive in the water released from the bottom of the dam, which is consistently cool, clear, and rich in productive minerals.

"In terms of producing biomass, the Bighorn is one of the most productive streams in the United States, but it's in a part of Montana that just doesn't look anything like trout country," says Frazer.

That doesn't seem to bother anglers, who crowd the upper 13 miles of the river below the dam and fish—primarily with fly gear—to catch brown and rainbow trout that average 15 to 19 inches long. In terms of angling pressure per mile, the Bighorn is one of the busiest fisheries in Montana.

"Historically it's been predominantly a brown trout fishery," says Frazer, "but that's changing. In the early 1980s, the ratio of browns to rainbows was about nine to one. Now it's more like three to one, and I'm guessing that when we emerge from this drought cycle, rainbows may come out on top. In this river, they seem to handle low water better than the browns do."

9 TONGUE RIVER RESERVOIR

For some folks, a Memorial Day without fishing Tongue River Reservoir is like an Independence Day without fireworks. The anglers are after crappies, and the spring holiday weekend is traditionally the "official" start of the panfish action at the reservoir, located just north of the Wyoming border, 100 miles southeast of Billings.

However, the crappies start biting much earlier. In April, as ice leaves the reservoir, the fish come shallow to spawn on submerged vegetation and rock piles.

Early in the season, you can catch fish from a boat or from shore. The hands-down favorite bait-lure combination is a crappie jig tipped with a small minnow, though a worm below a bobber will work, too, and some boaters do well trolling small spinners or tiny minnow imitations. Though crappies are the most common catch at Tongue River Reservoir, and limits of fish are filled regularly, anglers also pick up plenty of smallmouth bass, walleyes, catfish, and carp.

By July, the panfish are scattered and suspended over deep water, so they can be hard to catch. If you come in the summer, try targeting bass, walleyes, or catfish instead.

TIM EGAN

CHILD'S PLAY: Like so many fisheries across eastern Montana, the Tongue River Reservoir consistently provides great fishing even for the Snoopy rod crowd.

WATER, WATER EVERYWHERE

At Flathead Lake State Park, you can swim, snorkel, sail, sea kayak, or just sit by the shore and let the waves lap at your feet

WILD HORSE ISLAND AS VIEWED FROM THE STATE PARK'S BIG ARM UNIT BY BARBARA THOMAS

By David Madison

It's early on a summer morning, and Bert Finch, state park ranger, has wild horses on his mind. Though ordinarily busy patrolling the lake, cleaning facilities, delivering supplies, and greeting park visitors, today Finch has agreed to give me a special tour of Flathead Lake State Park, and especially the park's jewel, its Wild Horse Island unit.

Unlike Montana's other major state parks, Flathead Lake has no main visitor center but instead comprises six different units (all previously individual state parks) incorporated in 1992. Flathead Lake is not so much *a* state park as it is a collection of wondrous state park portions.

So that I can see as much of the lake as possible, Finch wants to take the scenic route, a beachcomber's meander around Flathead's 122,500 acres, before finally landing at Wild Horse Island later in the afternoon. That's when we'll take to the forest and trail in search of bighorn sheep and the wild horses for which the island is named.

In the calm of sunrise, the lake's surface is still smooth, allowing us to speed away in Finch's 22-foot outboard from the dock at the state park's Big Arm unit. We motor past Bootlegger Island and White Swan Point, then around Black Point. Approaching Bull Island, we see snowfields high in the Mission Mountains to the south.

Along the island's shore, pleasure boats bob by private docks. A thick forest of Douglas fir and ponderosa pine extends to the waterline. Between the cliffs along Flathead Lake's 185 miles of shoreline are stony beaches that create a three-color palette of diffused crimson, earthy light brown, and slate gray.

From Bull Island, we head north past a rock outcropping dotted by double-crested cormorants—black, fish-eating water birds commonly seen standing on rocks and posts. As we cruise through The Narrows, which separates shallow Polson Bay from the deep, open water of the main lake, Finch points at his depth gauge. In seconds, it drops from 20 to 170 feet. At its deepest point, Flathead Lake reaches 369 feet.

"Quite a piece of water," he says, moving his hand in a slight arc, tracing the oceanlike curve of the choppy horizon ahead. Covering nearly 200 square miles, Flathead is the largest natural freshwater lake in the American West.

The state park was established to allow people to experience this vast and scenic body of water. Most visitors come to fish, camp, or

PARK PADDLER: At more than 120,000 acres, Flathead Lake resembles an inland sea. The glacier-fed water and numerous state park sites attract sea kayakers, who find smooth paddling between the lake's many islands.

HEATH A. KOVACEVICH/FLATHEADLIGHT

just spend an afternoon along the shore.

Though we don't visit them on this day's outing, the state park's five other units (besides Wild Horse Island) are spread out along the lake's scenic shoreline. Big Arm, ten miles northwest of Polson, is a popular jumping-off point to Wild Horse. Campers pitch their tents at sites under a stand of mature ponderosa pine and juniper. A long beach attracts sunbathers and swimmers. Birders say the nature trail there is a great one for spotting a variety of species.

Next along the west shore is the aptly named West Shore unit. Here, glacially carved rock outcrops rise from the lake to overlooks that provide sweeping views of the water and the Swan and Mission Mountains to the east. Considered the most private of this state park's units, West Shore is graced by towering firs, pines, and larches. The beach is rocky, so sand castles are out, but visitors can swim, boat, and camp there.

Just south of the town of Bigfork is the Wayfarers unit. From spring through late fall, wildflowers abound along a nature trail running from the rocky shoreline to a band of cliffs rising from the lake. A popular picnic spot for Bigfork residents, this site also has a boat ramp, trailer dump stations, flush toilets, and a scenic beach.

Along the middle of the lake's east shore sits the park's Yellow Bay unit. Often overlooked by visitors heading to the larger sites, this small parcel has a secluded feel. It includes four walk-in tent camping spots and a wide, sandy beach used by swimmers, sunbathers, and scuba divers. In spring, tree blossoms color nearby hillsides, the heart of Montana's famous cherry orchard region.

A PARK OF PIECES: Flathead Lake State Park is composed of six units and several islands. There is no main park visitor center, but all the shoreline units have camping sites, water, and picnic areas.

MONTANA OUTDOORS

At Flathead's southeast end, sticking into the lake like a bent finger, is the Finley Point unit. Located in a secluded, mature pine forest, this spot provides 16 campsites with running water as well as boat slips and a boat pump-out station.

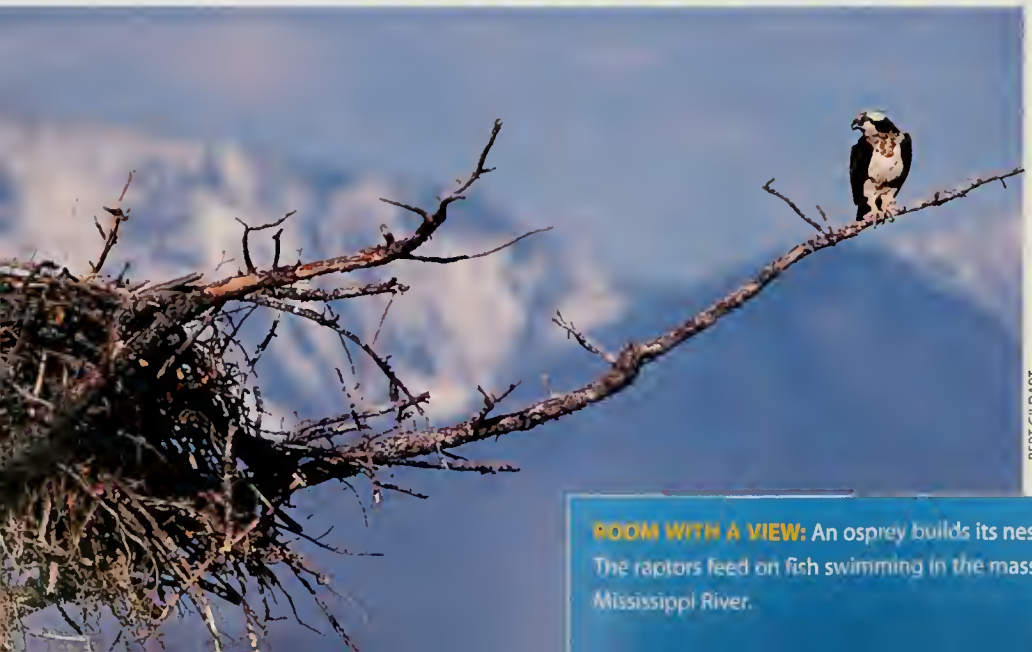
Though numerous, the state park units are relatively small and secluded. Many visitors are surprised to find privacy even in the campsites, which in other campgrounds can be crammed together like seats on a bus.

"People tell us the camping experience they find at Flathead isn't available in many other places anymore," says Ken Soderberg, FWP State Parks Division resource program manager. "The tall trees overhead, the stars in a dark night sky, the smell of woodsmoke—it's the kind of camping they remember having when they were kids."

As we continue our boat trip around the lake's southern portion, we pass numerous sea kayakers. They and other boaters often tour Flathead by following a marine trail around the lake, stopping along the way at shoreline park sites or at several of the lake's scenic islands, like the one Finch and I are now approaching.

"See how pristine that is?" the park ranger says as we near the picturesque shore of Bird Island. Inland from the pebbled beach, a lush bed of moss grows beneath a canopy of Douglas fir and ponderosa pine. The water, as it gets deeper, fades from a sun-soaked shade of aquamarine to bright emerald to dark blue.

Despite its allure, we pass by Bird Island and head north. After a long haul across the lake and then past the high cliffs called Painted Rocks, we approach Cedar Island's rocky shore. Cedar has few landing spots, so Finch heads for a popular cove on the southwest side. As we round the island's southern tip, he tells me visitors often snorkel just off-



BERT GILDART

ROOM WITH A VIEW: An osprey builds its nest in a dead tree along the Flathead Lake shoreline. The raptors feed on fish swimming in the massive natural freshwater lake, the largest west of the Mississippi River.

"People tell us the camping experience they still find at Flathead Lake isn't available in many other places anymore."

—Ken Soderberg, *FWP State Parks Division*

HEATH A. KORVOLA/LIQUIDLIGHT

shore of the 30-acre island.

Tonya Robinson has swam in this clear water many times. "In one place, the rocks are smooth and blue. It looks just like the bottom of a swimming pool," says Robinson, who along with her husband and two young daughters have come to the island in their 25-foot pontoon. The girls toss pebbles while their parents gaze out at sailboats cruising past.

After visiting with the Robinsons, Finch and I decide to take a hike. We're not ten feet into the forest before the sound of laughing children and rumbling boat engines is nearly drowned out by the singing of songbirds. Black-capped chickadees, red-breasted nuthatches, and yellow-rumped warblers dart among Douglas firs and western cedars. A breeze blowing off the lake is scented by the evergreens, which shade the old homesite of the island's original owners.

Cedar Island is now owned by the state. In the early 1950s, when FWP acquired it along with Douglas and Bird Islands, Canada geese were becoming less common in the region. The acquisitions preserved nesting habitat for these and other birds on a lake that has little secure nesting habitat.

"They're jewels on the lake," says Jim Williams, FWP regional wildlife manager. "It took incredible foresight 50 years ago to buy them."

Today, the small islands are designated as state wildlife habitat protection areas. Under a management plan now being developed, FWP is working to strike a balance between preserving bird nesting habitat on the three islands while still allowing some existing recreation to continue.

The draft management plan calls for installing official campsites to concentrate camping in areas where it causes the least disturbance to wildlife. The sites would be open most of the year, closing only for the spring nesting season.

Back in the boat, Finch and I head to Skeeko Bay, one of five designated FWP landing sites on Wild Horse Island. There we beach at a trailhead that loops into the island's backcountry.

The island is surprisingly diverse. Bighorn sheep roam the high country, and ospreys nest in the trees. Black bears swim out from the mainland to roam the shady forests and yellow fields of arrowleaf balsamroot. Coyotes stalk rodents and the occasional young or aged mule deer, keeping the deer population in check. And the island's four wild horses—one black, one buckskin, one paint, and one brown—graze on a prairie of owl clover, larkspur, yarrow, and nodding onion.

The prairie first fed horses roughly 300 years ago. Early European explorers wrote that Indians told them the first herds arrived as refugees from ongoing raids between the Blackfeet and Kootenai Tribes in the early 1700s. The Kootenai tried to outfox the rival tribe by swimming their best horses from island to island, hopscotch fashion, before finally hiding them on Wild Horse. The horses established a wild population, but they were removed after settlers homesteaded the island in the early 1900s. Thereafter, visitors would occasionally see a free-roaming horse or two, likely fugitives from an island rancher's corral.

In the early 1980s, FWP decided to officially restore wild horses to the island and adopted several from a feral herd on federal Bureau of Land Management property in eastern Oregon.

The horses were set free on this 2,163-acre mound of glacially formed cliffs and rolling Palouse prairie, a type of native grassland once common to this region.

As Finch and I hike through prairie bunchgrass and Idaho fescue, we scan the high crest to the west for wild sheep or horses. Finch isn't making any promises.

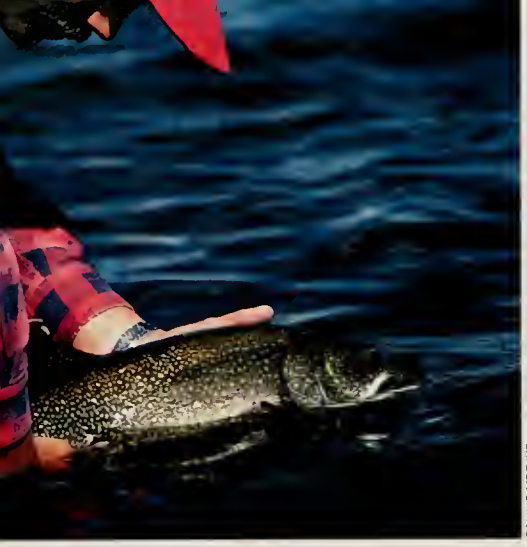
"No telling where they are," he says, leading me up a hill and then down a wildlife trail into a grove of tall pines, cool and shady. We hike a ways, pausing to glance up the hillside. The sunlight comes and goes, blocked and revealed by passing clouds. I'm walking slowly, listening to the wind in the trees, when I hear him whisper, "There they are."

Finch nods at me wide-eyed. I peer around a jumble of scrub pine to see all four horses grazing quietly. As I approach, the paint seems the most skit-

DONALD M. JONES

HATCHLING HAVEN: Three islands acquired in the 1950s provide nesting habitat for Canada geese, which had become rare in the region.

David Madison is a freelance writer from Whitefish.



PAUL F. UPDIKE

LAKER LIKERS: Most visitors to Flathead Lake State Park come for the renowned lake trout fishing there.

tish, while the black stares at me calmly, its long tail dragging over the prairie grasses.

I watch for several minutes, privy to a scene remarkably similar to that of three centuries before. While the horses graze, a hawk screeches overhead, and in the brush just up the ridge, a mule deer emerges, tailed by two fawns.

I continue to inch my way toward the horses. But then I get one step too close and the paint decides to bolt, alarming the others. All four race down a slope and disappear into the scrub pines.

Finch and I spend the rest of the afternoon hiking the island. We hope to see bighorn sheep, but they remain hidden, away from the hikers and beachcombers scattered around the island.

When we arrive back at the trailhead on Skeeko Bay, the place is crowded with boats. Sailboats are anchored just offshore, and speed boats are beached for an afternoon picnic. Of all the islands we've visited this day, Wild Horse is by far the most popular, Finch says. Every year, it sees roughly 10,000 visitors.

Currently Wild Horse and the other islands are accessible only to those who own or rent smaller watercraft, such as catamarans, sea kayaks, and small motorboats. Commercial operations that could bring additional lake visitors out to the islands in tout boats are currently prohibited.

Jerry Sawyer, supervisor for Flathead Lake State Park, says an advisory committee is now studying options for allowing some limited commercial activity. Based on comments from the committee, citizens, and FWP staff, the FWP Commission will decide on the issue later this spring.

"It's not that we're opposed to commercial use," says Sawyer, "but we do need to regulate it so we don't degrade the islands and lose the quiet, solitary experience they offer."

State park officials know that won't be easy. As development rapidly grows around the lake, the park sees increasing use from visitors and residents.

"There's not much public land left in the Flathead Lake area," says Doug Monger, FWP State Parks Division administrator. "Our biggest challenge is to continue providing visitors with the type of pristine experience like that now available at Wild Horse Island."

For now at least, Wild Horse Island still feels wild. As we prepare to head back to Big Arm, Finch reflects on the past 40-odd years and his many trips to Wild Horse. He's watched young bighorn lambs grow into adult sheep. He's spied coyotes on the hunt and black bears foraging in the grass. He once caught glimpse of a mule deer buck with antlers so big "they looked like trees growing out of the side of its head," he says.

Still, says Finch as we pull out of Skeeko Bay, "There's a lot on this island I haven't seen."

DAVID MADISON

UNBRIDLED INTEREST: Many visitors to Wild Horse Island hope to catch a glimpse of the island's four elusive namesake residents. A growing challenge faced by FWP is how to preserve the island's wild and tranquil setting while still accommodating increased use.

MONTANA OUTDOORS

IF YOU GO

Open: All year.

Information: (406) 751-4575, or on the Internet at: fwp.state.mt.us/parks.

Activities: Swimming, snorkeling, sailing, boating, sea kayaking, picnicking, fishing, hiking, wildlife viewing, camping.

Shoreline park units:

1. **Big Arm:** Shoreline camping, showers, a new *yurt* (large wall tent) available for overnight get-togethers, and a popular boat launch.
2. **Finley Point:** Boat slips, boat pump-out station, and 16 campsites with water.
3. **Yellow Bay:** A tiny park unit just off Montana Highway 35. Secluded. Tent camping only.
4. **Wayfarers:** A popular campground with showers, flush toilets, a pretty beach, and a hiking trail. Near a band of cliffs used for sunbathing.
5. **West Shore:** Awesome views of Flathead Lake and the mountains to the east. Overlook and terraced campsites offer scenic, lakeside getaways for overnights or picnics.

Shoreline park features: Secluded bays, islands, nature trails, beaches.

Services: Campsites, marine trail campsites for kayakers and canoeists, barbeque grills, leashed pets allowed, access for the disabled, public restrooms, water.

Directions: Follow U.S. Highway 93 north from Missoula. Take Montana Highway 35 to reach the shoreline units along the east shore and stay on U.S. 93 to reach the west shore units.

Flathead Lake size: 122,500 acres

State park established: 1955

TOM BAUER

CONTROVERSIAL CONFLUENCE: This view upstream from Milltown Dam, after a 2002 reservoir drawdown, shows the channels of the Blackfoot (left) and Clark Fork (right) Rivers, which have been blocked since 1908.

BREAKTHROUGH at Milltown Dam

After nearly a century, it appears likely this aging structure and its accumulated contaminants will finally be removed

BY TOM DICKSON

To understand fully how the dam at Milltown disrupts fish populations, consider the tale of Pollywog. David Schmetterling, a Montana FWP fisheries biologist, captured the 14-inch cutthroat trout in the spring of 2001 below Milltown Dam, located 10 miles upstream of Missoula at the confluence of the Blackfoot and Clark Fork Rivers. Schmetterling fitted the fish with a radio transmitter, transported it upstream, and then released it into the Blackfoot River. Using a receiver, he began following the trout's route over the next few weeks to Gold Creek, a tributary near Potomac, 15 miles upstream, where the fish spawned.

Also following the trout's journey were students of Seeley Lake Elementary School, who had adopted the trout as part of a program sponsored by FWP, the U.S. Fish and Wildlife Service, and Blackfoot Challenge, a local conservation group. Each week Schmetterling entered the cutthroat's location into his computer. The school kids followed the trout, which they named Pollywog, on a map via the Internet.

PAUL F. UPDIKE

CUTTHROAT EXISTENCE: Life for cutthroat trout and other native fish is brutal both below and above Milltown Dam, built in 1908 to supply electricity for two nearby sawmills.

After spawning, the fish headed downstream until it reached Milltown Reservoir, an impoundment created by the dam. And there it stayed until July 14, when an angler phoned Schmetterling to report he'd caught a northern pike with an antennae sticking out of its mouth.

"I hadn't put any transmitters in pike, so I asked him to read me the number on the transmitter," says Schmetterling. "I looked it up. It was Pollywog."

Schmetterling says the fate of that single, luckless trout illustrates why he and other state and federal biologists believe Milltown Dam must be removed.

"First of all, I caught it below the dam, where it was trying to swim upstream and couldn't," he says. "Then, after spawning, it tried to get back downstream past the dam and again, it couldn't. And finally, there was the pike. That trout didn't stand a chance."

BUILT TO MILL MINE BEAMS

Fish weren't a great concern of copper tycoon William A. Clark, who built the hydropower dam in 1908 to supply electricity for two sawmills on the Blackfoot River at nearby Bonner. Beams milled at the facilities were used to line shafts of copper mines located 150 miles up the Clark Fork River.

Mining had been underway at Anaconda and Butte since the 1870s, after Marcus Daly and others discovered what turned out to be one of the purest deposits of copper sulfide ever found in North America. A copper boom ensued, and soon the Clark Fork and tributaries such as Silver Bow Creek were filled with copper-laden spoil from the mining and milling of deep copper sulfide ores by Daly's Anaconda Copper Company.

Not long after Milltown Dam was completed, disaster struck. A record flood on the Clark Fork, in June 1908, washed tons of the mining sediment downstream, where it settled into the reservoir behind

the dam. And there it sat, and continues to sit. In subsequent years, additional mining and smelting (burning copper ore to extract the valuable metal) waste has been carried downstream by floods and runoff, where much of it has settled in the shallow impoundment. According to the Environmental Protection Agency, the reservoir now holds 6.6 million cubic yards of sediments, much of it containing high concentrations of arsenic as well as lead, zinc, copper, and other metals.

Its historic storage of toxins notwithstanding, for much of the 20th century Milltown Dam attracted no more public interest than a highway bridge. Anglers fished below the structure, where fish trying to swim upstream concentrated, and occasionally picnickers would sit along the shores of the small reservoir. In 1929 the dam was purchased by Montana Power Company, which maintained it for the next seven decades as a small-time power generator.

Not until the 1980s did Milltown Dam and the sediments in the mile-long reservoir become an issue. In 1981, high levels of arsenic were found in the Milltown drinking water supply. Two years later, EPA officials concluded that as water from the reservoir seeped down through the sediment, it was leaching arsenic into the underground aquifer connected to local water faucets. That year Milltown Dam was listed as Montana's first Superfund site.

According to the EPA, liability for cleaning up the contaminated sediment behind the dam fell to Atlantic Richfield Company, which had purchased Anaconda Copper Company in 1977. Over the past 20 years, the EPA and Montana's Department of Environmental Quality have undertaken several feasibility studies that looked at various cleanup alternatives ranging in price from $3 million to $300 million.

After years of debate and study, dam removal and sediment cleanup appear imminent. In 2001 Missoula County officials voted to support removing the dam for reasons including public safety and aquifer contamination. In January 2003, Governor Judy Martz announced she was "placing the full support of my office behind removal of the Milltown Dam at Bonner."

The governor later cited her concern for public health and safety, taxpayer liability if the aging dam were to collapse, and the federally threatened bull trout.

Tom Dickson is editor of Montana Outdoors.

FATEFUL FLOOD: In June 1908, just six months after Milltown Dam was finished, 33 consecutive days of rain sent a record flood down the Clark Fork River, bringing with it contaminated copper mine waste from Butte and Anaconda. Several million cubic yards of sediment settled behind the dam, where it has remained since. Among the toxins buried in the reservoir are high levels of trout-killing copper, shown here (right) on the banks of the Clark Fork near Galen.

EPA SAYS DAM MUST GO

Even bigger news came in mid-April, when the EPA issued its proposed plan for cleaning up the groundwater below Milltown. The dam and the sediments that have the highest concentration of contaminants should be removed, agency officials said, to ensure the "permanent, long-term protection" of public health and the environment. The estimated cost: $95 million.

Russ Forba, the EPA's Milltown site project manager, says the most important factor leading to the removal option is that the dam collects polluted sediment that will have to be cleaned out to prevent arsenic and other toxins from seeping into the aquifer. In addition, the EPA notes that the dam is structurally unsound, stores no water for irrigation, doesn't control flooding, and produces relatively little energy. Forba adds that the agency also considers the importance of restoring a free-flowing river system and its trout populations, and the support by both the county and the state for dam removal.

"Governor Martz's statement was very important," Forba says. "It's almost impossible for the EPA to move a project this big without the state's concurrence."

The EPA's proposed plan will be subject to public review until June 20. Later in 2003,

A TALE OF TWO RIVERS: Both the Blackfoot and the Clark Fork have potential to be great trout rivers, say biologists. Currently, however, both hold just a fraction of the trout that could live there were Milltown Dam removed and the watersheds restored. The Clark Fork trout population, for example, could increase five-fold following a restoration.

JOHN LAMBING

TOM SQUEA

A GLASS OF EVIDENCE: In 1981 Ed Zuleger, a sanitarian for the Missoula City-County Health Department, collected Milltown tap-water samples that turned out to have dangerously high levels of arsenic. Hyrdogeologists and chemists later determined that the source was the contaminated sediment in Milltown Reservoir. The EPA estimates that, if left alone, the sediment would continue to pollute water supplies for the next 2,000 years.

the agency will make its final decision.

"By federal law, we can then require the responsible parties to implement our decisions," says Forba.

Not everyone is calling for dam and sediment removal. Some local residents want the historic structure and reservoir to stay, and Bonner residents wince at the thought of losing nearly $100,000 each year in property tax revenue. Also, the corporation liable for the cleanup is questioning whether sediment removal might not actually worsen problems downstream.

"We have concerns about how dredging would stir up sediment and heavy metals," says Sandy Stash, Atlantic Richfield's Montana-based vice president. "We think people need to weigh the risks of leaving the sediment in place versus the risks of a massive dredging operation."

BIOLOGICAL BARRIER

State and federal biologists, however, contend that the best option for native bull trout and westslope cutthroat trout would be for the dam and sediment to go.

"Removing the dam would allow trout to move freely up- and downstream for the first time since 1908," says Mark Wilson, supervisor for the U.S. Fish and Wildlife Service in Montana. "As it now stands, it's what we call a 'biological barrier.'"

Though biologists now know the dam harms fish populations, that wasn't well understood as recently as 1998, when Schmetterling began doing his research. The listing of bull trout as a federally threatened species that year had increased the likelihood that Montana Power Company would have to provide fish passage. The biologist was hired to learn how the dam actually affects bull trout.

Over several months in 1998, Schmetterling and a crew of technicians captured 40,000 fish below the dam. The biologist estimates that number represented about 20 percent of the total, which means each year roughly 200,000 fish trying to migrate upstream are stopped by the concrete wall.

"The good news is that, after almost 100 years, fish still want to move upstream," he says. "The bad new is that they can't."

Of the 11 species blocked by the dam, the most abundant is the native largescale sucker, but the structure also halts the spawning runs of trout: bull, westslope cutthroat, brown, and rainbow.

Schmetterling also found that the dam blocks downstream movement. After trout spawn in tributaries of the Blackfoot or Clark Fork, up to 100 miles upstream, many then try to get back downstream of the dam.

"They want to go down, to exploit the various habitats there," he says.

But unless water is high and flowing over the dam, the fish remain trapped in the shallow reservoir. Many end up in the stomachs of northern pike.

The pike first showed up in Milltown Reservoir in 1998, likely having come down the Blackfoot via the Clearwater River from the Clearwater Chain of Lakes, where they had been illegally introduced in the 1980s. The nonnative fish thrive in the reservoir's still, shallow water and spawn successfully on flooded land vegetation that lines the banks.

Pike numbers took off quickly and exhausted the existing prey base, mostly a native minnow species. The hungry fish then turned their appetites elsewhere. In 2000 biologists found that pike had begun eating trout swimming downstream into the reservoir. For the toothy predator, it was like having dinner delivered by conveyor belt.

If predation and the migration barrier weren't enough to threaten the river system's trout and other native fish populations, Milltown Dam also increases the threat of copper poisoning. That became clearly evident in 1996, when a combination of weather events in February caused

NORMAN AND MAURINE JACOBSON

A TASTE FOR TROUT: Nonnative northern pike (right), which first appeared in Milltown Reservoir in 1998, quickly turned their appetites from minnows to trout. The warmwater species thrives in the shallow, still waters of Milltown Reservoir. Above: In 2002, FWP biologists netted and tagged pike before the reservoir was lowered to strand and kill young pike in back channels. Additional drawdowns are planned to keep pike numbers as low as possible.

massive ice floes to move down the Blackfoot and Clark Fork Rivers. Milltown Dam operators, worried the house-sized floes would damage the hydropower facility, lowered the reservoir water level by 8 feet in one afternoon. As the water dropped, the moving ice floes began digging into the river bottom and banks.

"Imagine a thousand bulldozers coming down the riverbed," says Sam Milodragovich, a biologist with NorthWestern Energy, which acquired the dam after purchasing Montana Power Company in 2001.

The flood of water, now filled with loosened sediment and accompanying toxins, rushed over the dam for several hours until dam operators were sure the structure would not be damaged. It wasn't. The trout and other fish downstream, however, were not so fortunate.

Concentrations of copper there skyrocketed 2,000 percent over state standards of 18 parts per billion, to 400 parts per billion. The toxic metal killed trout, other fish species, and the insects fish eat. FWP surveys found that the number of catchable brown trout was cut by half in the Clark Fork below the dam, and the rainbow trout population dropped by 62 percent. Harder hit were juvenile rainbows and browns, which declined by 71 percent and 86 percent respectively.

Bill Olsen, a U.S. Fish and Wildlife Service environmental contaminants specialist, says that if a flood were to blow out the aging dam—a distinct possibility considering that the Federal Energy Regulatory Commission has categorized Milltown as a "high hazard dam"—and flush the contaminated reservoir sediment, "the results to fish populations downstream would be catastrophic."

IN THE MEANTIME

Fortunately for those who value river health, it appears likely that the dam will eventually be removed along with the most harmful sediments. But that won't be for a while. According to Forba, the EPA official, the dam would be removed no sooner than 2011. In the meantime, Schmetterling says, "it would be irresponsible for us to ignore

MILLTOWN DAM TIMELINE

1867: Marcus Daly and others discover valuable copper deposits near Anaconda. Massive mining operations begin.

1929: Montana Power Company buys Milltown Dam from Clark's estate.

1850 — 1860 — 1870 — 1880 — 1890 — 1900 — 1910 — 1920 — 1930

1908: In January, Milltown Dam is completed and the reservoir fills. The hydropower facility, built by William A. Clark, provides electricity for two nearby sawmills.

1908: In June, a massive flood fills the new reservoir with tons of sediment and tailings from mills owned by Daly's Anaconda Copper Company upstream in Butte and Anaconda.

TOM BAUER

BEAR MARKET FOR BULL TROUT: Numbers of bull trout, like this specimen captured by FWP biologist Ron Pierce on the Blackfoot River, have dwindled since Milltown Dam was built. Biologists say dam removal could open access to spawning water and help allow the population to rally.

the problems of fish passage and the pike."

Over the past two years, FWP has been working with NorthWestern and the fishing group PikeMasters to temporarily lower water levels so that yearling pike are stranded and die in back channels of Milltown Reservoir. Similar drawdowns are planned for the future.

Also, the USFWS and FWP are recommending that NorthWestern build a temporary structure to allow fish passage until the dam is removed.

In the meantime, Schmetterling and his crew will continue trapping bull and cutthroat trout below the dam and hauling them upstream. "It's labor intensive," he says, "but in the short term it's a way to reconnect populations isolated by Milltown Dam."

In the long term, says Pat Saffel, FWP regional fisheries supervisor at Missoula, restoring the two rivers will require more than just removing the dam.

For example, another highly polluted Superfund site extends from Milltown Reservoir to Butte along the Clark Fork River and Silver Bow Creek. There the EPA, state and other federal agencies, Atlantic Richfield, and community officials and citizens are looking at a range of alternatives to reduce the toxicity and volume of arsenic, copper, and other toxins in soil and sediments in and along the river.

In tributaries to the Clark Fork and Blackfoot Rivers, planning and work are also underway to restore spawning habitat, reduce sediments washing into the water, and prevent trout from getting trapped in irrigation ditches.

Currently, say state officials, the Clark Fork holds only 20 percent of its potential fish population. State and federal biologists say the end result of restoration will mean more trout and other native fish species throughout the two river systems.

"In the fisheries management business, we get excited about removing a culvert," Saffel says. "It's rare to work on restoration at such a large geographic scale as this."

> "Let me put it this way. I've worked for the U.S. Fish and Wildlife Service for 26 years, and I've never before seen a project that has the potential to do so much for bull trout...."
>
> —Mark Wilson, *U.S. Fish and Wildlife Service*

The value of dam and contaminated sediment removal extends even beyond better fishing and a reconnected river system. Citizens and community leaders are talking about possible whitewater boating, hiking trails, picnic grounds, and other recreational and economic benefits from the restoration.

One idea envisions travelers on nearby I-90 taking the Bonner exit to see the restored Blackfoot River, immortalized by Norman Maclean in his classic novel, *A River Runs Through It*.

"Let me put it this way," says Wilson. "I've worked for the U.S. Fish and Wildlife Service for 26 years, and I've never before seen a project that has the potential to do so much for bull trout and other fish species, and that has so many tremendous benefits for the people living in the affected drainages."

1950 1960 1970 1980 1990 2000

1977: Atlantic Richfield Company buys Anaconda Copper Company.

1981: High levels of arsenic are found in Milltown's drinking water.

1983: The EPA declares Milltown Dam as Montana's first Superfund site; liability falls to Atlantic Richfield.

1998: Bull trout are listed as a federally threatened species. Northern pike appear in Milltown Dam.

2001: Missoula County officials vote for dam and sediment removal.

1996: In February, ice floes dredge from the Clark Fork River tons of contaminated sediment, which washes downstream, killing more than half the fish below the dam.

2003: In her State of the State address, Governor Martz announces her support for dam removal.

2003: In April, the EPA issues its proposed plan on Milltown Dam. Agency officials say removing the dam and the most polluted sediments will protect public health and the environment.

DAVE HAGENGRUBER / MONTANA FWP

NET GAIN: FWP biologist Dave Yerk with a shovelnose sturgeon captured as part of ongoing fish population monitoring in the Missouri River below Fort Peck Dam.

What FWP does to conserve Montana's fisheries and improve your fishing

Fish Management Demystified

BY DAVE HAGENGRUBER

It's a great day to be working outdoors in Montana. The spring sky this morning is brilliantly clear, the wind is light, and new growth bursts out along the river below Fort Peck Reservoir, an impoundment of the Missouri River in northeastern Montana.

Montana FWP biologist Dave Yerk and his three-person crew are dredging the water with 150-foot-long nets to capture fish. Working from an 18-foot aluminum jet boat, they slowly uncoil their nets into the water. When all the nets are extended across a part of the channel, Yerk and his crew cut the engine and glide silently downstream with the current, taking a short break while the nets go to work. In ten minutes, a beeping stopwatch announces the end of this "drift."

"Get ready to see what it's all about," says Yerk, grinning. "Pulling nets—this is what us fish guys live for."

As the survey nets are hauled, a fish smorgasbord comes into view: blue suckers, smallmouth buffaloes, channel catfish, goldeye, sauger, and shovelnose sturgeon. Skillful hands remove the fish and drop them into a large holding tank.

The crew never knows what the nets will capture. A few weeks earlier, they netted an intact bison skull.

The nets secured within the boat, the crew begins to "work" their haul. With efficiency developed by thousands of repetitions, they measure and record the length, weight, species, and sex of each fish. Many are tagged before being slipped back into the river. If a tagged fish is later captured in FWP survey nets or by an angler who reports the tag, biologists will know more about the specimen's movements and growth rate.

The work of Yerk and his crew is part of what is broadly called fish management. Because the term is so vague, it's not surprising most anglers don't know what it means. Yet it's important they do. Montana FWP spends roughly $7 million on fisheries management each year. Roughly half comes from fishing license sales and the other half from a federal excise tax on fishing equipment. The better anglers understand what fisheries management is and why it's important, the better they can work with FWP to ensure Montana's fisheries are being managed well and cost-effectively.

Although the methods of fisheries management vary widely, from scuba diving to genetics testing, the work has always captured the imagination of anglers. Watching an electrofishing boat head out into the night, seeing a hatchery truck lumber up from a boat ramp, or just peering into the depths at a suspended survey net, generations of Montana anglers have asked, "What exactly are they *doing* out there?"

What do fisheries managers do?

Fisheries management means keeping watch over, and taking care of, the state's diverse fish populations and their habitats. For example, fisheries biologists have created more trout spawning water at Wade Lake, near the upper Madison River. Using heavy equipment, they dug a serpentine channel from a shallow spring inlet and lined it with gravel (below), providing trout with additional places to lay eggs.

DAVID A. SCHMIDT

Conserve and restore fish habitat

DONALD M. JONES

Provide access

Creating a new fishing access site (above) can sometimes take years of public meetings and discussions with adjacent landowners. FWP has purchased 320 of these public water accesses across the state, and more are planned. Other fisheries management work is based on the results of ongoing fish population surveys. Using sinking nets on reservoirs and electroshocking on streams (right), biologists are able to see how fish populations are faring from year to year.

Gather information

One thing biologists do constantly is collect information from ongoing river and reservoir surveys. The work is an essential part of fisheries management. Along with creel surveys and public input, the survey information helps biologists decide if and when to stock, whether harvest regulations are necessary, and how environmental conditions affect fish populations. Follow-up monitoring and angler surveys help FWP see if specific management techniques, such as fry stocking or a length limit, are having the desired effects on a particular fishery.

Without these surveys, biologists would have no idea how fish populations were faring from year to year.

"Monitoring fish populations is probably the most important and visible fisheries management activity that our biologists perform," says Chris Hunter, FWP Fisheries Division administrator in Helena.

Dave Hagengruber is an FWP aquatic education specialist in Helena.

Biologists keep tabs on fish populations in various ways. They mark some fish with an identifying tag and then later don wetsuits and masks to count tagged fish underwater. Or they'll use an electric charge to temporarily stun fish, which are then measured and weighed before being released. Biologists also capture fish using dozens of different net styles and sizes, depending on which particular species they are after.

Yerk, whose crew uses sinking gill nets to capture fish on the Missouri River below Fort Peck Dam, points out that biologists cannot capture and record every fish in the river. Rather, he explains, they take samples from standardized locations and then compare results from one year to the next.

"If we see a population trend moving up or down," Yerk says, "we'll look closer and try and figure out the cause."

Rear and stock fish

If biologist see fewer fish in a population, one solution may be to stock. Growing fish in hatcheries and then putting them in lakes and rivers is the oldest form of fisheries management. And Mark Sweeney, manager of the Washoe Park hatchery in Anaconda, says biologists have learned much from more than a century of stocking trial and error.

"In the past, the approach was simply to try and stock everything, everywhere," he says. Sweeney explains that such a willy-nilly approach to stocking often failed to provide more fishing opportunities. It also led to the loss and weakening of native and wild fish populations.

"The role of our hatcheries today has changed," he says. "We still provide fish for anglers, sure, but we're also involved with restoring native species and even in helping recover at-risk species like pallid sturgeon and westslope cutthroat."

Having learned from past mistakes, fisheries staff now take many factors into consideration before releasing hatchery fish into the wild. Hatchery managers must ensure they don't spread disease, such as bacterial kidney disease, recently discovered in the Big Springs trout hatchery in Lewistown. Hatchery fish are regularly checked for sickness at FWP's fish health laboratory, located in Great Falls.

FWP biologists also take pains to ensure

JEFF HENRY/NORTH COCHEJAUNE PICTURES

Gather information

GEORGE B. KIRSCH

Rear and stock fish

Though famous for its wild trout, Montana still relies heavily on hatcheries for much of its reservoir and mountain lake fish management. FWP produces roughly 40 million fish in nine state hatcheries each year (above). Fish management also means conducting research, such as collecting scales from Big Hole River grayling for DNA analysis (right).

JEFF HENRY/NORTH COCHEJAUNE PICTURES

Conduct research

they don't stock fish that would interbreed with wild strains and dilute pure gene pools, such as if rainbow trout were stocked in lakes where they could escape and mix with westslope cutthroats.

After carefully considering these and other factors, such as the health of a reservoir's prey fish base, or anglers' demands, biologists submit requests for hatchery fish.

Then it's the job of the hatcheries to raise the various species to the correct size and then distribute the fish by the right date for stocking. "It can be a real juggling act," Sweeney says.

Conserve and restore habitat

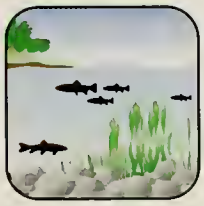
Another fish management challenge is to provide fish with adequate habitat. Ever since 1947, when Montana hired its first fisheries biologist, habitat enhancement and conservation have been integral to the state's fisheries management program. Without healthy habitat, say biologists and the growing number of anglers who understand the connection, fish populations suffer.

"We describe fish habitat as having three main components: water quantity, water quality, and the physical characteristics of the streambed or lake," says Dick Oswald, fisheries biologist in Dillon.

Oswald manages the major southwest Montana drainages such as the Beaverhead, Big Hole, and Ruby, as well as smaller streams and mountain lakes. It's some of the best coldwater habitat in North America. Unfortunately, much of it is in trouble.

"The water quantity issues—the droughts—have been the dominant feature in my 20 years down here," Oswald says.

When river flows drop, trout populations suffer. The fish have fewer places to reproduce and hide from predators, and low river levels can cause water temperatures to rise to dangerous levels.



"There's no way to keep the drought from socking these fish," says Oswald. "But we do everything we can to minimize that impact."

FWP works closely with irrigators, providing technical advice and, in some cases, financial assistance to reduce water use from streams. The agency also encourages anglers to release fish, and, when necessary, has imposed harvest restrictions or even closed seasons on particularly hard-hit waters.

Fish population surveys by Oswald and his crew show these efforts are helping fish populations survive the drought, though not enough to fully offset losses from four years of low water.

Environmental laws passed by the Montana legislature provide some stream protection. For them to work, however, Oswald has to spend time with landowners and local conservation districts. The districts must approve any project that could affect fish habitat. Oswald advises landowners on how to lessen potential damage to streams from proposed projects so they can get the required permits.

In places where fish habitat has been damaged, FWP uses fishing license dollars set aside in the state's Future Fisheries Program to enhance and renovate streams, rivers, and reservoirs. One such project on a small stream in the Ruby Mountains is providing much-needed habitat for native westslope cutthroat trout.

"When we began, that stream was pretty well destroyed and only had about 40 fish per mile," says Oswald. "We've pretty much done a complete rebuild of habitat there and have seen explosive growth of the population, with over 1,000 fish per mile now. That's pretty exciting to see."

GEORGE ROBBINS

LANDOWNER RELATIONS: So that stream protection laws work as the legislature intended, biologists help private landowners find ways to not damage essential stream fish habitat (above).

TELLING THEIR STORY: Fisheries biologists extend the reach of their work by educating youngsters and by informing adult anglers of FWP management activities and public fishing opportunities.

"When we do a good job managing these resources, we enjoy the benefits of good fishing along with everyone else."

—Dave Yerk,
FWP Fisheries Biologist

DAVE RANEY

Provide access

All the fish in the world won't do anglers any good, however, unless there is a way for people to reach the water and cast their lines. Though access is not difficult to provide on rivers running through state and federal land, it's a challenge where fishing waters cross private property, such as in south-central Montana.

"Private land makes up almost 80 percent of our region and an even a higher percentage along the shoreline of the limited water we have here," says Jim Darling, FWP regional fisheries manager at Billings. "Access is so important. Being near water is just a basic human desire. People want to boat, picnic, walk their dogs, and especially to fish. My job is to respond to that need and provide access for them."

The challenge is that landowners often don't want the public near their property.

"We realize that an access site can be an intrusion on neighboring property," Darling says. "But we do our best to lessen those effects and still provide reasonable access to the public."

FWP currently maintains 320 fishing access sites in Montana. Most are primitive: an access road, dirt or gravel parking area, boat ramp, and perhaps a pit latrine. One dollar from the sale of every resident fishing license and five dollars from the sale of each nonresident license is earmarked to acquire and maintain access sites across the state. In some cases, FWP pays landowners to allow public access to a fishery.

Conduct research

If access brings anglers closer to the fish, research is the part of fisheries management that brings the fish closer to FWP biologists. Through research, biologists find answers to perplexing management problems. Though FWP's Fisheries Division has no formal research unit, biologists often become impromptu researchers when they need information that doesn't exist. Take, for example, the mystery of the Yellowstone River's missing sauger.

Following the drought of the late 1980s, FWP's three biologists in the agency's southeast region documented a sauger population decline. Most puzzling, however, was that sauger numbers never recovered in the early 1990s, despite higher water.

"Back then, we didn't know very much about these fish," says Brad Schmitz, regional fisheries manager at Miles City.

With the aid of a Montana State University graduate student, Schmitz's crew began to conduct telemetry studies, tagging captured sauger and then following the fish with radio receivers.

"After two years of research, we had a pretty good handle on where the sauger went, what they do during their annual cycle, and what might be impacting their population," Schmitz says.

One disturbing discovery: Up to 100,000 adult sauger were disappearing down water diversion structures each year.

"That was an important find," says Schmitz. "Those numbers far outweigh any impact fishing pressure might ever have on this part of the river."

To stem those losses, biologists have begun identifying ways to modify one particular diversion structure so it traps fewer sauger. Another possibility would be to augment wild populations with stocking.

"My goal is to protect and enhance this sauger population," Schmitz says. "But at the same time, we need to continue to provide fishing opportunities for anglers."

Schmitz's point cuts to the heart of what he and his colleagues are charged with doing. Fisheries management demands of biologists an attention not only to fish and habitat, but also to the anglers who fund their management activities.

That challenge is made easier by the fact that fisheries biologists are often their own customers. As Yerk points out, "I'm an angler, too—and my love of fishing is what first attracted me to this career. When we do a good job managing these resources, we enjoy the benefits of good fishing along with everyone else."

wildflowers

Trillium
Trillium ovatum

In a state where natural beauty is so often expressed in massive proportions – majestic mountains, glacial rivers, broad expanses of prairie – it's easy to forget about the tiny beauties underfoot.

A reminder…

"In the places most difficult to access I found the most beautiful flowers. It would seem as if they wished to hide the delicate members of their family from the rude gaze of the world, sheltered in some nook of the rocks, like a miniature conservatory tenderly cared for by the fairies of the mountains.

Often you will see a most beautiful specimen growing just beyond your reach on some rugged point. The desire to possess it is so great you can hardly resist the dangerous reach. I once saw a whole bed of fine bell-shaped flowers on a point above me, impossible to climb. I had spent days in trying to find this variety, and here they were a few feet above my head, but no human hand could touch them. They grew wondrously beautiful while I gazed, and I imagined they grew larger and larger until they looked like a whole chime of bells ringing out a dirge to my disappointed ambitions."

—Emma Homan Thayer, *Wild Flowers of the Pacific Coast*, 1887

Groundsel
Senecio pseudaureus

Monkey Flower
Mimulus lewisii

MIKE ELLIOTT

Flowers... are the proud
assertion that a ray of beauty
outvalues all the utilities of the world.

—Ralph Waldo Emerson

Meadow Rue
Thalictrum occidentale

MARK LAGERSTROM

Prickly Pear
Opuntia polyacantha

JUDY WINTULICH

Sagebrush Buttercup
Ranunculus glaberrimus

Bear Grass
Xerophyllum tenax

Woods Rose
Rosa woodsii

Elkhorns Clarkia
Clarkia pulchella

"Still—in a way—nobody sees a flower—really—it is so small—and we haven't the time—and to see takes time, like to have a friend takes time."

—Georgia O'Keeffe

Yellow Pond Lily
Nuphar polysepala

Keeping the ribbon BLUE

EAGLE WITH MISSOURI RIVER RAINBOW BY PAUL J. LITTKE

Faced with whirling disease and increased angling pressure, FWP biologists try to maintain the Missouri River's nationally renowned trout fishery

BY BRUCE AUCHLY

THE LATEST REPORTS from the Missouri River in west-central Montana are mixed. On the one hand, the 35-mile stretch of world-class trout fishing between Helena and Great Falls still provides some of the biggest and most abundant rainbow trout in North America, and it will probably continue to do so for some time. On the other hand, the trout fishing here could well be past its peak. Though it still offers anglers unparalleled public access and more than 4,000 trout per mile, the blue-ribbon reach faces two big threats: growing angling pressure and, even more serious, whirling disease.

"The bottom line is that it appears there will be more anglers in the future and fewer fish," says Steve Leathe, FWP regional fisheries supervisor at Great Falls. "We're doing all we can to maintain a quality fishery, but it's pretty obvious that it's undergoing some real significant changes."

COLD AND FERTILE

The Missouri River runs nearly 2,500 miles from its headwaters at Three Forks to St. Louis, Missouri, where it meets the Mississippi. Fish populations thrive along the river's entire length, but the stretch most suited for trout is a relatively short one starting at the town of Wolf Creek and ending near Cascade, where the river leaves the mountains and cuts across flat prairie toward Great Falls.

Though cutthroat trout and arctic grayling no doubt existed in this stretch for thousands of years, the modern history of the trout fishery there begins with the 1912 construction of Holter Dam, a few miles east of Wolf Creek. For 35 miles below Holter Dam, the river winds through a canyon along I-15, mimicking a giant spring creek. The continuous flow of cold water coming from the deep reservoir bottom is steeped in phosphorous and other minerals from the Missouri's headwater tributaries, which rise from Yellowstone National Park, 250 miles to the south. The nutrient-rich water sustains thick beds of aquatic vegetation, nourishing a supermarket of insect life. Beginning in the 1930s, state fish managers began to add brown trout and rainbow trout, and…presto.

Stocked trout thrived in the cold, fertile

MONTANA WATER CENTER

END OF THE RAINBOW? Whirling disease, deadly to rainbow trout, first showed up on the Missouri River in 1996. Within four years, it had infected nearly all the young rainbows in a major spawning tributary.

STEVEN AKJE

THE MO'S 'BOWS: The stretch from Craig to Cascade is famous for beefy, plentiful rainbow trout (right). At left: The river temporarily stands empty of anglers upstream of Craig, a stretch holding roughly 4,000 trout per mile.

water. But drastic fluctuations in water levels often dried up side channels, vital habitat for young fish and aquatic insects. Until 1974, when dam operators agreed to stabilize river flows, water came downstream from Holter Reservoir at rates ranging, in a single day, from 1,000 cubic feet per second (cfs) to 7,000 cfs. Anglers didn't fare much better than trout in the rapidly fluctuating water levels.

"I remember getting stranded on some sandbars in the river," says Kevin Devine, a Great Falls native. "When I would try to get back to shore, the water had risen above my waders."

After several years of intense negotiations with FWP, Montana Power Company (which recently sold Holter Dam to PPL-Montana) agreed to a recommended minimum flow of 4,100 cfs and an emergency minimum flow of 3,000 cfs for drought years.

As the Missouri River trout population was improving from stabilized river flows, FWP further helped the fishery by no longer stocking trout in it or any other Montana rivers. Studies had shown the practice was detrimental to wild trout, which, once stocking ended, thrived without the competition for food and habitat from hatchery fish.

With river flows stabilized and competing hatchery trout gone, the Missouri's wild trout population grew. Throughout the 1980s, FWP surveys in the Craig section, a few miles downstream from Holter Dam, showed high numbers of trout, ranging from roughly 3,000 to 4,000 per mile.

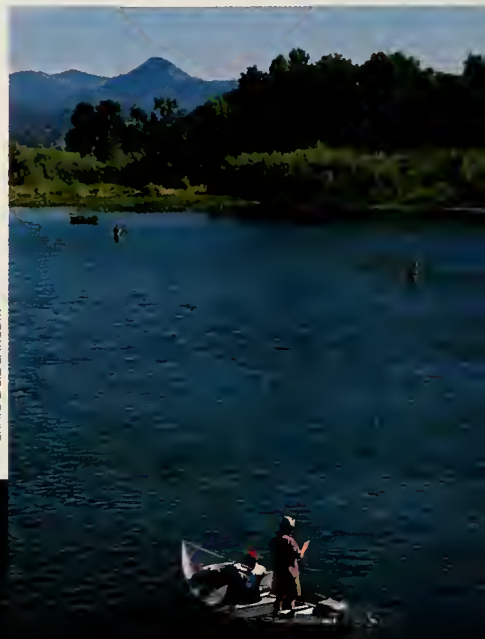
Not only are the Missouri River's trout abundant, but they also grow big, and quickly. Andrew Munro, a fisheries doctoral candidate at Montana State University, has found that it takes Missouri rainbows just three years to reach 17.25 inches long. By comparison, three-year-old rainbows on the storied Madison River are 14 inches long.

WORD SPREADS

Locals kept word of the large, abundant trout mainly to themselves. It wasn't until the drought in the late 1980s, which dried up other Montana trout fisheries and sent anglers scurrying to the Missouri, that word really started to spread. Since then, fishing pressure and media attention have only grown. Local anglers still rue the day in 1999 when *The New York Times* ran a story on the charms of Craig, Montana, and the phenomenal trout fishery there, triggering yet another immigration.

Fisheries surveys confirm that increased angling pressure is more than just perception. In 1991, the Missouri's 35-mile blue ribbon stretch had 65,526 "angler days" (one angler fishing a body of water for any amount of time during one day); by 2001, the annual number of angler days had nearly doubled to 123,472. The survey also showed that resident anglers were sharing the river with more people from out of state, though nonresidents were still in the minority. From 1991 to 2001, the percentage of nonresident anglers on the Missouri went from 15 percent of total use to 31 percent.

Some area residents welcome the influx of tourists showing up on the Missouri.



CRAIG & LIZ LARCOM

MISSOURI MOB SCENE? Though uncrowded by Eastern or Midwestern standards, the Missouri has become too populous for some local anglers.

Bruce Auchly is an FWP regional information officer at Great Falls.

Business owners say nonresident anglers boost the local economy, from gas stations and cafes to fly shops and guide services.

But to many resident anglers, the sight of more out-of-state plates at riverside parking areas means fewer fishing opportunities. Devine has fished the Missouri River long enough to see its transformation from near obscurity to one of the nation's premier trout fishing destinations. And he has noticed in particular how the pressure now extends well beyond just the traditional midsummer hatches.

"We used to fish cold, windy days and never see anyone," Devine says.

No more. Devine recalls an episode on such a day last year when drift boats stacked up upstream of a prime fishing spot, awaiting their turn like airplanes in a holding pattern over a crowded runway.

"People were waiting an hour and a half to fish that hole," he says. "Finally, we quit and went home."

Devine used to fish the Missouri year-round but now takes a five-week hiatus in late summer when the crowds become too thick. Steve Ortez, also of Great Falls, says his fishing on the Missouri is down from three dozen trips a year to just eight or ten. Ortez, who has been fishing the river since he moved to Montana in 1964, admits his frustration with crowding occasionally boils over, resulting in at least one shouting match with another angler.

But Devine, who has seen the river go from something like a lightly traveled road to a Los Angeles freeway, says he's not ready to exit.

"I could never quit fishing the Missouri," he says. "It's just too good."

DISEASE SPREADS

It may not stay that way for long, however. Whirling disease has infected nearly all the rainbow trout in one major spawning tributary and has recently shown up in another. As a result, say FWP biologists, the trout population in the Craig section could crash within a few years.

"We know we're going to lose some rainbow trout to whirling disease," says Leathe. "The questions is: How many and for how long?"

Whirling disease evolved in Europe, came to America in 1956, and was discovered in Montana's Madison River in 1994. The disease starts when a parasite consumes the cartilage of young trout. In worst cases, the spine bends, causing the fish to swim in circles, or "whirl." Severe infections can lead to physical deformities that reduce a fish's ability to feed and avoid predators, resulting in death.

Rainbows are far more susceptible than brown trout, which is not good for the Missouri, where the former far outnumber the latter. Whirling disease first showed up there in 1996, when biologists discovered it in fish taken in Little Prickly Pear Creek, one of two main spawning tributaries on the blue-ribbon stretch. Concern turned to alarm in 2000, when fish surveys in the same stream showed that nearly all the juvenile rainbow trout were infected.

Little Prickly Pear and the Dearborn River, which enters the Missouri a few miles downstream from Craig, produce almost all the rainbow trout in this reach of the Missouri. Each spring, the fish swim up the two streams and build thousands of redds, or spawning beds, on underwater gravel. The tiny fry that hatch out in June typically spend their first year in those tributaries. Then, at about 3 to 4 inches long, they head downstream to the Missouri, to grow big on the river's rich diet of underwater insects.

Whirling disease has changed that on Little Prickly Pear. Before the disease peaked, biologists estimated 30,000 one-year-old rainbows migrated from the stream into the Missouri each year. Surveys conducted by FWP and Montana State University researchers found that by the late 1990s, the number had dropped to 7,000, a 77 percent reduction. The agency now considers the stream to be one of the most severely affected in Montana.

Fish surveys conducted in the fall of 2002 show the results of poor rainbow "recruitment" (how many young fish exist in a population to replace older ones in the

DAVE HAGENBUCH/FWP/MONTANA FWP

SPORE SPY: FWP's fish health biologist Jim Peterson examines fish tissue for signs of parasites, such as the spore *Myxobolus cerebralis*, the culprit behind whirling disease. Below: The spore, shown in its triactinomyxon stage, readies to attach to a trout scale.

MONTANA FWP

future) in the Craig section. That stretch is representative of the first 10 river miles below Holter Dam and contains fish hatched primarily from Little Prickly Pear Creek. There, according to FWP fisheries biologist Travis Horton, the surveys show an estimated 4,262 rainbows, ranging from 6 to 23 inches long. While that's a tremendous number of fish, what's especially interesting is that more than half, almost 2,300, were in the 17- to 23-inch category. Horton found only about 900 fish per mile measuring 14 to 17 inches and a mere 17 rainbows per mile in the 11- to 14-inch group.

The number of large fish per mile may excite anglers, but those trout were produced before whirling disease struck. What concerns Horton are the juvenile fish in the population, or, more precisely, the lack of juveniles.

"The younger fish are not there," he says.

Leathe adds that low water in Little Prickly Pear in recent years has certainly contributed to the low numbers of small fish.

"But we're certain the main cause is whirling disease," he says. "We've now had four consecutive years with relatively few rainbow yearlings in the Craig area, even though there's been a record number of spawners and some good water flow some of those years. In 21 years of surveying that trout population, we've never seen more than two poor years in a row until recently, even during the severe drought of the late 1980s."

One bright note: The 2002 surveys show strong recruitment downstream. The Cascade section, which represents the trout population in the lower 25 miles of blue-ribbon water from Craig to Cascade, contains fish hatched primarily from the Dearborn. There, Horton's crew found fewer rainbows overall than in the upper stretch, which is normal because the upstream water has always been more productive. But the biologists also found a record 2,200 one-year-old rainbow trout per mile. That's five times as many young rainbows as in 2001 and twice the long-term average.

It's also a sizable portion of the Missouri's future. Because the Dearborn produces roughly twice the young rainbows Little Prickly Pear does, it could offset declines in reproduction elsewhere. But if the Dearborn were hit with a massive outbreak, the Missouri could lose entire generations of future catchable rainbows.

Such a scenario is a distinct possibility. The disease was found in some Dearborn rainbows examined in 2001, and in 2002 the severity had greatly increased, though a major infestation has not yet occurred.

"It's a big concern," says Leathe.

Though biologists haven't yet seen the decline in big fish in the upper part of the Missouri's blue-ribbon water that they predicted a few years ago, they say it's simply a matter of time.

"Either the population is about to crash," says Leathe, "or adult fish are coming from downstream and filling in the population."

The news on the Missouri is not all grim, however. Leathe says brown trout numbers throughout the blue-ribbon stretch are at all-time highs: "We're seeing 1,000 browns per mile over 10 inches. That's a lot of brown trout."

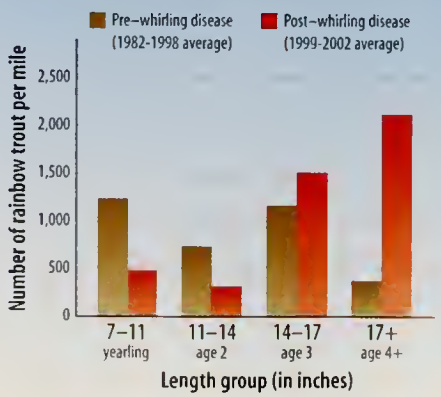
FWP RESPONDS

Both crowding and whirling disease are largely beyond FWP's control. But the agency has increased management activities in response to the Missouri's changing trout fishery. In the late 1990s, with whirling

Great today but grim tomorrow

Recent FWP fish surveys indicate a troubling future for Missouri River rainbows. Biologists are finding far fewer small trout (below left) than will be necessary to replace the larger, older ones that will eventually die. "The younger fish are not there," says one biologist. Where have the small fish gone? While drought may have contributed somewhat to the decline, an FWP regional fisheries supervisor says, "We're certain the main cause is whirling disease."

Missouri River rainbow trout population
Craig Section



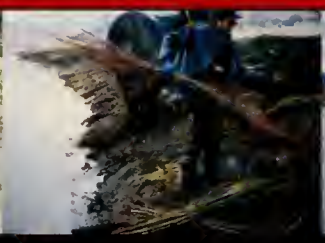
Inverted pyramid

Imagine a healthy rainbow trout population as a pyramid, with relatively few big fish on top and many little fish below to take their place in the future. Whirling disease inverts the pyramid, diminishing year classes needed for the fishery's future.

MONTANA OUTDOORS

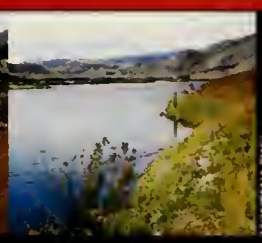
BANK MANAGERS: To help offset the damage to rainbow trout numbers by whirling disease, FWP has been working with members of Trout Unlimited and other groups to screen trout-enticing irrigation ditches and restore habitat on the Missouri River and two important spawning tributaries:

1. On the Missouri River downstream of Craig, straight-cut banks were eroding away, sending silt into cobbles where aquatic insects live.



2. In 2001, crews sloped back the banks to reduce the erosive effects of river current and then planted willow bundles several inches under the soil.

3. Next, crews covered the exposed bank with biodegradable mesh netting, which protected the area until the vegetation was established.



4. As the vegetation grows, its roots hold the bank in place. Erosion has since stopped here, allowing the river ecosystem to function as it should.

MONTANA FWP

disease threarening Montana's rainbow populations like a stock market crash, FWP urged the governor to establish a whirling disease task force. The group focused attention on the disease, suggested remedies, and sought research funds.

In 1998, after weighing input from the task force as well as from FWP biologists and local anglers, the FWP Commission lowered the rainbow trout limit on the Missouri's blue-ribbon stretch from five fish to three.

Then in 2002, the commission lowered the limit again to just one fish on the upper 14 miles (though it retained the three-fish limit from Dearborn to Craig). That move sparked criticism from Trout Unlimited, which wanted catch-and-release only, and from some local anglers, who complained the limit had dropped far too low.

"People still like to eat fish, but they won't go up there for just one trout," says Ortez.

In addition to adjusting regulations, the agency is also working on improving spawning habitat.

"Our goal is to produce as many trout as the river can handle," says Leathe. "We want to make sure access is good for fish to reach spawning areas where there is no whirling disease."

FWP biologists are knocking holes in beaver dams that block spawning trout movement upstream in smaller tributaries still free of whirling disease. Working with members of Trout Unlimited and other groups, they've also screened an irrigation ditch in Little Prickly Pear to keep rainbows out and have modified an irrigation ditch that had been blocking rainbow migration on another tributary.

FWP has also increased surveys of anglers and funded new research. The agency recently completed fieldwork on a one-year creel survey to see if the new one-fish regulation is working as intended to protect adult fish. Munro, the MSU graduate student, is studying the microchemistry in trout bones to learn which tributaries the fish came from. The work will help Leathe and Horton figure out whether or not trout are moving up from Cascade and filling in the Craig section.

To address the crowding issue on the Missouri and other popular Montana rivers, FWP has convened a 22-member river recreation advisory council to suggest principles and policies to help reduce conflicts.

Regardless of the council's recommendations, due in May, crowding will always be a matter of perspective. Many locals accustomed to solitude find the Missouri's many newcomers intolerable. "A lot of people are saying they've given up," says Ortez.

Yet other anglers, such as Minnesotan Brad Moore, find the river's crowds bearable even during the summer high season.

"Sometimes in the evenings there are a lot of drift boats coming through," says Moore, a wade angler. But he adds that it's a small price to pay for an unbearable combination of scenery and angling opportunities. "You have this beautiful arid area and there's this wonderful fishery," he says.

And that's not just a tourist's opinion. Many local anglers still marvel at the river's bounty and express faith that, as long as whirling disease stays contained, the Missouri will continue to provide for everyone who fishes there.

"Even for the meat fishermen," says Devine. "I think it's still a very accommodating river."

WAITING GAME: Anglers can do nothing but keep their fingers crossed that the Missouri's famous rainbow trout fishery can withstand whirling disease. In the meantime, the river continues to produce world-class fishing for locals and a growing number of visitors.

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STATE PARKS 2003 EVENTS CALENDAR

MAY

3, 24 Canoe and Kayak Demo Day, *Frenchtown Pond State Park, 10 a.m.–5 p.m.* Free sea kayaking and canoeing clinic. (406) 542-5531.

10 Canoe and Kayak Demo Day, *Spring Meadow Lake State Park, all day.* Free sea kayaking and canoeing clinic. (406) 495-3270.

10 Family Fun Day, *Giant Springs State Park, all day.* Bird watching, hatchery tours, kite flying, snakes, kids' fishing with free loaner rods. (406) 454-5858.

17, 18 Northern Rockies Paddlefest, *Flathead Lake State Park, Wayfarers Unit, all day.* Free sea kayaking and canoeing clinics. (406) 752-5501.

23, 30 Friday Night Campground Program, *Lewis and Clark Caverns State Park.* Talks on history, nature, and other topics. (406) 287-3541.

24 Canoe and Kayak Demo Day, *Frenchtown Pond State Park, 10 a.m.–5 p.m.* Free sea kayaking and canoeing clinic. (406) 542-5531.

24 Live Music, *Bannack State Park, 7–8 p.m.* High Country Harmony. (406) 834-3413

31 Archeological Discoveries, *Bannack State Park, 2–3 p.m.* Hear about the fossils discovered at nearby Lima Reservoir and ancient Indian sites. (406) 834-3413.

JUNE

6 Montana Pay Dirt, *Lewis and Clark Caverns State Park, 8 p.m.* History of Montana gold mining, plus a chance to pan for gold. (406) 287-3541.

JUNE
8
Take a Kid Fishing Day
Lake Elmo State Park, all day.
Volunteers teach kids how to cast, reel, and hook and land a fish. Free loaner rods.
(406) 247-2955
DAVE HAGENGRUBER/MONTANA FWP

7 National Trails Day, *Giant Springs State Park, all day.* A 4-mile guided trail hike along the 1805 route taken by Captain Meriwether Lewis. (406) 454-5858.

7 Live Music, *Bannack State Park, 5-8 p.m.* Traditional bluegrass. (406) 834-3413.

7-8 Montana State Orienteering Championship, *Lone Pine State Park, 12–2 p.m.* The state's top map and compass readers race around the park. (406) 751-4574.

8 Take a Kid Fishing Day, *Lake Elmo State Park, all day.* Free fishing instruction. Loaner rods available. (406) 247-2955.

12, 19, 26 Giant Springs Interpretive Series, *Giant Springs State Park, 7–8:30 p.m.* Presentations on history, nature, and other topics. (406) 454-5858.

12, 19, 26 Lewis and Clark History, *Travelers' Rest State Park, 7 p.m.* Topics vary, but all relate to the Corps of Discovery. (406) 273-4253, travelersrest.org.

13 Mountain Climbing, *Lewis and Clark Caverns State Park, 8 p.m.* (406) 287-3541.

14 Buzzard Day, *Makoshika State Park, all day.* Celebrate the annual return of turkey vultures to the park with games, food, and family fun. (406) 377-6256.

14 Meet "Mark Twain", *Bannack State Park, 2–3 p.m.* The legendary humorist and author comes to life. (406) 834-3413.

14 Traditional Pow Wow Dancing, *Missouri Headwaters State Park, 7–9 p.m.* Demonstration by a champion dancer. (406) 994-6934.

15 Father's Day Shoot, *Makoshika State Park, all day.* Archery, 3-D and paper targets. (406) 687-3412.

17, 24 Discovery Days, *Spring Meadow Lake State Park, 7–8:30 p.m.* Various educational programs on natural history topics. (406) 495-3270.

20 Montana Wildlife, *Lewis and Clark Caverns State Park, 8 p.m.* Presentation on the stories told by animals' teeth and fur. (406) 287-3541.

21 Ulm Rhubarb Festival, *Ulm Pishkun State Park, all day.* Treats, recipe swap. (406) 866-2217.

21 Weed Pull Day, *Russell Gates Fishing Access Site, 10 a.m.* Help local conservation groups remove invasive plants. (406) 677-6804.

21 Live Entertainment, *Bannack State Park, 5–8 p.m.* Cowboy poets and music. (406) 834-3413.

21 Apsaalooka Tribe Women, *Missouri Headwaters State Park, 7–8 p.m.* A glimpse into the Crow Indian culture from a woman's perspective. (406) 994-6934.

21, 28 Campfire Talks, *Black Sandy State Park, 7–8:30 p.m.* Natural history topics. (406) 495-3270.

22 Dale Tash Montana History Day, *Bannack State Park, all day.* History of Bannack State Park. (406) 834-3413.

27 Heritage Trails of Montana, *Lewis and Clark Caverns State Park, 8 p.m.* Historic trails and how they have shaped Montana travel and culture. (406) 287-3541.

28 Museum Grand Opening, *Chief Plenty Coups State Park, 1–4 p.m.* Local Crow drummers, singers, and dancers. (406) 252-1289.

28 Pioneer Diary Entries, *Bannack State Park, 2–3 p.m.* Written accounts of Montana life before microwaves and DVDs. (406) 834-3413.

28 Blackfeet Tribe Songs and Stories, *Missouri Headwaters State Park, 7–8 p.m.* A Grammy-nominated Blackfeet Tribe singer and storyteller will provide the entertainment. Toast marshmallows around the fire afterwards. (406) 994-6934.

30 Discover Travelers' Rest, *Travelers' Rest State Park, all day.* Corps of Discovery return visit anniversary. (406) 273-4253, travelersrest.org.

Clark's Nutcracker

(Nucifraga columbiana)

TOM ULRICH

MANY BIRDS WILL inadvertently plant some shrubs and other vegetation after seeds pass through their digestive track. But a Clark's nutcracker will plant an entire forest in its lifetime. The high-elevation whitebark pine stands of Montana and the entire Rocky Mountain West would not exist were it not for this cone-cracking, seed-caching bird.

INTERESTING INTERACTION

Whitebark pine cones don't open naturally, as do most other pine cones. Rather, the cones are ripped apart by Clark's nutcrackers, which feed on some of the fresh seeds and then cache the rest to eat later. Whitebark pine reforestation occurs when these buried seeds germinate. Scientists refer to Clark's nutcrackers and whitebark pines as co-evolved mutualists, meaning they evolved together with interactions beneficial to each. In this case, the whitebark pine provides high-protein food to the nutcracker, which in turn distributes and plants the tree's seeds.

IDENTIFICATION

Named for William Clark of the Lewis and Clark Expedition, this nutcracker was first observed by the Corps of Discovery in 1805. The explorers mistakenly identified the bird as a woodpecker species after watching it pound its chisel-like bill on pine cones. The following year, Lewis studied the bird in detail and recognized it as a member of the *Corvid*, or crow family, which also includes ravens and jays.

Clark's nutcrackers are larger and more robust than gray jays. Male and female nutcrackers look alike, sporting a pale gray head and body, and black and white wing and tail feathers. Their long, pointed bills and undulating flight appear woodpecker-like, but the raucous vocalizations soon reveal their crow family lineage.

BY ELLEN HOROWITZ
Freelance writer, Bozeman

BUILT FOR BUSINESS

The bill of the Clark's nutcracker is like a multi-tool: chisel, tweezers, storage compartment, hoe, and planter. The nutcracker first hammers into cones and plucks out the seeds. These it stores in a pouch positioned beneath the bird's tongue. As the pouch fills, the bird's throat bulges. Once it has pocketed roughly 80 seeds, the nutcracker looks for a cache site. There, it makes several sideward swipes with its bill to create a trench for burying the seeds, which it coughs up one at a time. The bird plants three to five seeds at each location, then carefully covers them with soil.

MEGA-MEMORY

Diana Tomback has studied Clark's nutcrackers for more than 25 years. A University of Colorado professor and director of the Whitebark Pine Ecosystem Foundation in Missoula, Tomback says Clark's nutcrackers have remarkable spatial memories. In one season she documented a bird depositing 35,000 seeds in 9,500 caches.

"They can transport seeds as far as 8 to 12 kilometers and fly as much as 3,000 feet in elevation, up or down slope, to cache seeds," Tomback says.

Experiments show that nutcrackers recall exact locations by using landmarks, and that they can remember the locations of seeds for up to nine months.

FOOD AND FAMILY LIFE

Throughout the year, nutcrackers migrate up or down mountainsides as food becomes available. Starting off in the high country, they begin eating whitebark pine seeds around mid-July and start caching them by mid-August. The birds gradually travel downslope to find ponderosa pine, limber pine, and Douglas fir seeds in fall. They also eat insects, berries, mice, and carrion.

The year-round Montana residents winter in mid- to low-elevation forests. Courtship begins as early as December and the female generally lays her eggs in March, earlier than any other songbird species (yes, all *Corvids* are songbirds). The birds pair for life and share duties incubating the eggs and feeding their two to four offspring. Tomback believes that the early nesting provides more time for young birds to learn from their parents. As snow melts on open subalpine slopes in early June, the nutcracker family migrates upward. Adults uncover the previous year's whitebark larder to feed the screaming, begging fledglings. By the time the new seed crop ripens in mid-July, the young will move on to collect and store their own food.

FUTURE UNCERTAIN

Tomback says she's concerned about the future of Clark's nutcrackers. Whitebark pines are rapidly dying from blister rust disease, she says, and the trees are being shaded out by Douglas firs, which have thrived during decades of fire suppression. Several national forests now thin competing trees and use prescribed fires to restore whitebark pine forests, which should in turn benefit the tree species's historic seed distributor, the Clark's nutcracker.

END OF THE LINE

For nearly a century, anglers have fished below Milltown Dam, shown here. Built in 1908, and closed since November 2001, the hydropower facility blocks the upstream movement of trout, suckers, and other species that congregate below in large numbers. To reach the fish, anglers stand on shore and make long, high casts, which don't always go as intended.

Though it creates this particular fishing spot, the aging dam benefits neither trout nor trout anglers, say biologists. By stopping up- and downstream migration, it prevents fish from reaching vital habitats in the Clark Fork and Blackfoot Rivers. By forming a small reservoir, it has allowed trout-eating pike to thrive. And by storing harmful contaminants washed down from upstream mining waste, the dam endangers the lives of both fish and humans.

For more on the controversial structure and its effects on fish, see our story on page 17. Photo by Craig & Liz Larcom.

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